

DESIGNING TELEVISED INSTRUCTION  
FOR COLLEGE CLASSES

By  
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by

Jon D. Morris

DEDICATION

In honor of

Leah N. Morris

and

In loving memory of

Ann D. Morris

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# TABLE OF CONTENTS

	PAGE
ACKNOWLEDGMENTS.....	iv
LIST OF TABLES.....	viii
ABSTRACT.....	ix
CHAPTERS	
1 INTRODUCTION.....	1
Statement of the Problem.....	3
Questions and Hypotheses.....	3
Need for Study.....	4
Delimitations.....	6
Limitations .....	7
Definition of Terms.....	8
2 REVIEW OF THE LITERATURE.....	11
Instructional Development Models.....	14
Previous Reviews of Television	
Effectiveness Research.....	16
Comparing Learning with	
Television to Learning With	
Other Methods and Media.....	17
Measuring the Effect of Variations	
in Television Production	
Techniques and Values on Learning.....	23
Summary.....	34
3 METHODOLOGY.....	38
General Research Design.....	38
Design of Treatment.....	40
Instruments.....	44
Selection of Subjects.....	47
Collection of Data.....	49
Analysis of Data.....	50
Anticipated Findings.....	53
4 PRODUCERS' INSTRUCTIONAL TELEVISION	
(PITV) MODEL WITH EXPERT EVALUATION.....	56
The PITV Model.....	56
Experts' Evaluations of the PITV Model.....	66

5	QUANTITATIVE AND QUALITATIVE FINDINGS.....	73
	Results.....	74
	Focus Group.....	74
	Experimental .....	88
	Summary.....	95
6	CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS.	99
	Introduction.....	99
	Conclusions.....	99
	Implications.....	105
	Recommendations For Further Study.....	108
APPENDICES		
A	COVER LETTER AND QUESTIONNAIRE FOR TELECOURSE EXPERTS.....	112
B	LIST OF EXPERTS AND THEIR ADDRESSES.....	115
C	FOCUS GROUP INTERVIEW SCHEDULE.....	117
D	POSTTEST OF CONSUMPTION FUNCTION.....	124
	REFERENCES.....	126
	BIOGRAPHICAL SKETCH.....	131

## LIST OF TABLES

	PAGE
TABLE 5-1 Descriptive Statistics for Pretest and Posttest Scores by Study Group.....	91
TABLE 5-2 Ancova For Total.....	92
TABLE 5-3 Ancova For Score.....	93
TABLE 5-4 Pairwise Comparisons For Total.....	94
TABLE 5-5 Pairwise Comparison for Score.....	94



Abstract of Dissertation Presented to the Graduate School  
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A MODEL FOR DESIGNING  
EFFECTIVE TELEVISED INSTRUCTION  
IN COLLEGE CLASSES

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The purpose of this study was to analyze and compare the effects of a segment of televised instruction which adhered to elements of a producer's model with a camera of record (nonmodel-developed) segment of televised instruction in a college course. A Producers' Instructional Television (PITV) Model was developed for this study in order to improve the production quality of televised instruction and thereby improve college student achievement.

A three-stage evaluation process was used to evaluate (a) the model, (b) the tapes, and (c) the effectiveness of the model-developed videotapes. A panel of five expert telecourse producers, using a five item, open-ended survey

questionnaire, critiqued the PITV Model. Two focus groups, at the University of Florida, with five students in each group, compared and analyzed the model-developed and the nonmodel-developed videotapes and made recommendations for improvement. An experimental comparison was then made with a control and two treatment tapes, to determine the impact on student achievement. In January of 1985, in the Principles of Economics 2013 telecourse, at the University of Florida, posttest scores of 113 students, 57 in the control group, 31 in treatment group one, and 25 in treatment group two, were compared. The experimental tape comparisons were made in a non-randomized control group, pretest-posttest design using an analysis of covariance (ANCOVA).

The results indicated that (a) the experts had reservations about the model and seemed to think that the PITV model was most appropriate for beginning producers; (b) the focus groups were able to identify a production technique (music/drama) that they perceived to be ineffective, in the model-developed videotape; and (c) there was a significant difference among the three groups on posttest measures of student achievement.

Treatment tape one (with music/drama) and treatment tape two (without music/drama) produced significantly increased student achievement while the control tape did

not. This study showed the PITV Model to be an effective method of improving telecourse videotapes. Student test scores improved over a camera of record presentation when the videotape was developed using the PITV Model.

## CHAPTER 1 INTRODUCTION

The title of an article by Gavriel Salomon, "On the Future of Media Research: No More Full Acceleration in Neutral Gear" (1978), reflected the lack of progress in media research, specifically televised instruction. Several reasons have been given why televised instruction research has contributed little to the improvement of the learning environment.

First, much of the televised instruction research has become out-dated (e.g., Carpenter & Greenhill, 1958; Lumsdaine, Sulzer, & Kopstein, 1951; Mercer, 1952; Vandermeer 1954; Vestal, 1952), thus limiting the value of the results. The quality of television processing equipment has improved greatly since research on televised instruction was conducted in the 1950s and 1960s. Many unique television production capabilities have been developed, including videotape, special effects, and satellite interconnections, but little research has been conducted to determine how to use this technology effectively. Metallinos (1980) has said, "the failure to recognize the key differences between the media of film and television is a major reason for the lack of empirical research in television composition" (p.1).

Second, instructional research has been limited in applicability because researchers have continued to repeat research which opposes one medium (television) against another (lecture method) with little insight into how each of these presentations was developed (Chu & Schramm, 1967; Morris, 1983, 1984). Third, in the limited number of studies (Barbatsis, 1978; Davis 1979) which have compared methods of presentation within the medium of television, there has been a continuing interest in isolating variables to measure their effect on achievement. This approach at times has overlooked the cumulative effect of variables on student achievement, an effect which could be greater than the sum of the individual results.

Methods and models have been proposed to assist in the development of media products (Cambre, 1981) for instructional purposes. A review of these models suggested that they were inadequate for the development of methods of instruction in televised college courses because they did not include recommendations for the use of production techniques that were unique to television. Moreover, a review of the literature also indicated that those instructional models that may be applicable in part to the development of instruction for a telecourse were weak in the evaluation processes incorporated within the models.

### Statement of the Problem

The purpose of this study was to analyze and compare the effects of a segment of televised instruction which adhere to elements of a producer's model with a camera of record (nonmodel-developed) segment of televised instruction in a college course. A major problem facing the field of televised instruction is the lack of production models and current research on the development and impact of televised instruction at the college level.

### Questions and Hypotheses

Two questions and two hypotheses were developed for evaluating the model. They were as follows:

1. Do experts, who have been asked to evaluate a producers' model, find it useful for producing televised instruction?
2. Does information and feedback provided by a focus group suggest methods by which model-developed televised instruction might be revised and further improved?

Hypothesis 1. There will be no differences in student achievement between students who view model-developed televised instruction and students who view nonmodel-developed televised instruction.

Hypothesis 2. There will be no differences in student achievement between students who view model-developed

televised instruction and students who view model-developed televised instruction with a selected production technique deleted.

The production technique that was deleted from the model-developed televised instruction was identified in a focus group analysis as an unnecessary distraction. The production technique was music/drama.

#### Need for the Study

Researchers (Chu & Schramm, 1967; Gagne, 1980), educators (Bronfenbrenner, 1976; Newell & Olejnik, 1980), and television production text writers (Utz, 1980; Zettl, 1984) have for a long time suggested that student achievement can be increased through the application of certain techniques designed to gain and hold attention. In a television production, these techniques have been referred to as production techniques (Zettl, 1984). Although many of the suggestions for attracting and holding attention go beyond the scope of this research effort because they are unrelated to television production, many can be applied in a model for the development of a televised instructional presentation. A search of the literature, however, indicated that little had been done to verify the value of these suggested techniques in enhancing student achievement.

With regard to college student achievement, Gagne (1980) has isolated five factors pertinent to human learning and educational technology. These factors are "Attention, Selective Perception, Semantic Encoding, Effects of Prior Knowledge, and Metacognition or Cognitive Strategies" (pp. 8-11). Of these five factors, two were used to guide the development of the television production in this study. They were (a) Attention, arousing the learner's interests; and (b) Selective Perception, directing the learner's field of concentration. Neither of these factors were tested directly, but they seemed reasonable factors to apply to a television production. Moreover, these two concepts have been tested in various other instructional formats.

Fifteen of the 18 studies on televised instruction or film production reported in the review of literature section for this research were conducted during or prior to 1960. Dreher and Beatty (1958) stated that "the use of television for educational purposes is too new to characterize all of its strengths and weaknesses" (p. 8). In the only studies since 1960 found to have been measuring the effective use of televised instruction (Barrington, 1972; Davis, 1979 ), irrelevant variables were mixed and compatible variables were isolated. For example, Davis (1979), in order to arouse students' attention, or to enhance attention, inserted action war scenes from the television program



"Battle Star Galactica" into a film demonstration on house building. This procedure was an attempt to assess the ability of sophisticated production techniques to attract the learner's attention to the televised subject matter. The clips failed to attract the desired attention. This result was not surprising, since the clips were irrelevant to the subject of instruction. In fact, the clips probably distracted attention from the concepts presented. In response, this study attempted to develop and use a model that incorporated television production techniques that fit the college instructor's subject matter.

Salomon's (1978) survey of research, which was conducted in Israel, indicated that the lack of televised instruction research is not confined to the United States. Media researchers in Belgium at Ghent State University concluded "that there is a lack of basic information about learning by television, which results in an intuitive approach of the optimization process called 'methods-media trade-off'" (Herrel, 1972, p. 20). In contrast, the current study attempted to provide information about learning by television via the development of a producer's model that contained a strong and diverse evaluation component.

#### Delimitations

A review of the literature indicated that only a few curriculum and instruction models were applicable in part to

the development of televised instruction, with none being directly applicable. Moreover, the evaluation processes incorporated within these same models were weak when applied to televised instruction.

This study was delimited to include a producer's model, a camera of record (control) videotape, two treatment (model-developed) videotapes, and three methods of evaluation. The control tape was an exact recording of a live lecture. Treatment tape one was an enhanced version of the control tape using several appropriate television production techniques as prescribed by a producer's model. Treatment tape two was a copy of treatment tape one with a selected variable (the music/drama segments) eliminated.

#### Limitations

The limitations of this study were as follows:

1. The experimental portion of this study focused on the improvement of a single one-hour lecture; therefore, the results may not be generalized beyond that.
2. The subject of the lecture was the Consumption Function, which is an economics topic. The results of the experiment may or may not apply to other courses or subjects.
3. Several television production techniques were combined to create a cumulative effect on learning. Therefore, the independent variable was composed of several techniques,

and no single technique was identified as the cause of improved student achievement.

### Definition of Terms

The operational definitions of some of the major terms employed in this research were as follows:

Abstract examples. These are representations using charts, graphs, graphics, and alpha-numeric characters. In this study, graphics were used to construct abstract examples in the televised instruction.

Student Achievement. This was the percentage of correctly answered items on a standardized, objective posttest prepared by the instructor of Economics 2013 at the University of Florida. Two sets of achievement scores were examined: (a) the cumulative overall posttest score, identified as Total, and (b) the cumulative score for these posttest items that pertained to an understanding of the application of the consumption function to real consumption in economics activities, identified as Score.

Concrete examples. These were photographs and visuals that were used to provide examples of real-life scenes of consumers in buying situations in the model-developed tape.

Focus groups. These were qualitative in-depth research groups of five to eight respondents designed to provide feedback about an instructional television production.

Producer's Model. This was a plan or guideline for the development of telecourses and from which treatment tapes one and two in this study were developed.

Production values. These are a reflection of the production quality of a television presentation. Television is a visual and aural medium. Productions that maximize these attributes are considered high in production values, while productions that minimize these attributes are considered low in production values. The control (camera of record) tape in this investigation was an example of low production values while the treatment tapes were examples of high production values.

Telecourse. This is a course that is delivered to the student solely by television. In this case, the course was Economics 2013 at the University of Florida, Gainesville, Florida, in 1985.

Televised instruction. For this study, it is the use of television as the sole method for conveying information and knowledge about the consumption function in a college course, Economics 2013. Students gathered in a typical classroom, for fifty minutes, to watch two or more television sets. No instructor was present in the room. All instruction was provided via television.

Chapter 2 contains a review of literature for this study. The methodology employed in the study is discussed

in Chapter 3. Chapter 4 contains a detailed description of the Producers' Instructional Television Model and experts' evaluation of the model. The results of this study are presented and analyzed in Chapter 5. Chapter 6 contains a summary, conclusions, implications, and recommendations.

## CHAPTER 2 REVIEW OF LITERATURE

The quality and quantity of studies on the effectiveness of instructional television in higher education have been quite limited. This limitation has been due to at least two factors. First, there has been the factor of time, since television has been available to the public for only 30 years (Brown, 1977). By comparison, the first illustrated printed textbook was written over 300 years ago (Schramm, 1977), thus allowing for years of repeated research on the effectiveness of this medium.

Although studies comparing the effectiveness of television with other media, as measured by achievement, have been numerous over the past 30 years, only 12 studies were located, in this review, which measured the effectiveness of one method of television presentation (variations in production values) over another. All but three of these studies were conducted in or before 1960. Of the three studies conducted since 1960, one was reported in the 1960s and two were reported in the 1970s.

A second factor limiting research in this area has been the progress of technology. Many of the benefits attributed to television as a medium, including those benefits which focus on instructional effectiveness, were not technologically possible until the late 1950s and early

1960s. Technological breakthroughs made during this time included special effects and video tape recording (Brown, 1977). These breakthroughs enabled the experimenter to manipulate time, scenes, and transitions.

This review of literature has been divided into five sections: (a) a review of instructional development models; (b) other related reviews of literature on the use of instructional television, to assist in forming the bases for this literature review; (c) a narrowing of the focus to research studies which made comparisons of television to other media in terms of viewer or student achievement; (d) the further narrowing of focus to research studies, such as this one, which sought to compare variations in television and film production techniques in terms of viewer or student achievement; and (e) a summary.

The section which discusses some of the more significant reviews of literature on instructional television has been included because most of these reviews were conducted to support or refute hypotheses on the relationship of television production values to learning. Often these reviews have relied on research that was 15 to 20 years old, thus excluding recent developments in television production techniques.

The review of literature for this study consisted of (a) an Educational Resources Information Center (ERIC)

Search, conducted on January 14, 1981, and repeated on May 12, 1983, using the identifiers educational, television, instructional, experimental, and empirical; (b) a personal review of 134 bibliographic listings; (c) a review of 57 abstracts; (c) a review of 11 dissertation abstracts; (d) a review of 67 studies; and (d) a citing of 30 studies including the initial trial of the experiment used in the current study.

Studies comparing television with other media or cross media studies have been quite numerous. Although indirectly related to the problem investigated in this study, comparative studies were not used extensively to support the investigations reported here. As a result, only selected research has been reported here to show some of the major findings from this form of research.

Studies measuring variations in television and film production values have been direct measures of one method of television or film presentation versus another. These studies had a direct relationship to this study. Twelve of the thirteen studies included in this section constitute the reported empirical studies found to measure methods of effective production in instructional television. Nine of these twelve studies were film studies. One study was the initial trial of the experiment used in the current study.



### Instructional Development Models

Instructional development models abound (Brown, Lewis, & Harcleroad, 1983; Davis, Alexander, & Yelon, 1974; Gagne & Briggs, 1979; Johnson & Johnson, 1971; Reigeluth, Bunduson, & Merrill, 1978), but few have addressed media development directly and none of those examined were directly applicable to the development of television production as a method of instruction. Most of the models have included provisions for the use of television as instructional material, but did not detail procedures for the development of the material and did not address the situation where television was the sole method of presentation, i.e., telecourses.

Gagne and Briggs (1979), for example, developed a media intensive model which concentrated on media selection and provided little specificity for media development. The model focused on delivery systems, media selection procedures, methods of media selection, and adaptation of the model to the project circumstances (Gagne & Briggs, 1979). Moreover, the Davis, Alexander, and Yelon (1974) model made no mention of media and thereby typified the situation with many other instructional development models. Reigeluth, Bunduson, and Merrill (1978) highlighted the need for an analytical approach to the design and production of

instructional media but delegated the tasks to a differentiated staff of media technicians.

These models provided some direction for general media application, but no model has been found that addresses television production directly. In the media selection process, general media selection guidelines have been applicable. For the development of the television production, however, the responsibility has been shifted to the television production technician with no guidance in technique. This void has been further compounded when the television production is more than a material for an instructional presentation. In telecourses, the students' experiences are vicarious; yet no instructional development model was found in this author's review that discussed methods for developing these experiences in video.

Insight into the basic requirements of a model for the development of a television production were gained by examining the criteria for media selection. "If moving pictures are the stimulus choice, the media available are film and videotape" (Gagne & Briggs, 1979, p. 186). How magnification, motion, slow motion, and the other attributes of the video component can best be used to present the instructional message needed to be addressed through the development of a television production model.

Previous Reviews of Television Effectiveness Research

Other reviews of literature have often used outdated, insufficient studies to support conclusions about the effective use of instructional television. Citing Mercer's (1952) and McIntyre's (1954) studies, Schramm (1977), in Big Media, Little Media, concluded that "there is a long line of studies emphasizing the advantage of simplicity and clarity in media instruction" (p. 41). In Chu and Schramm (1967), the authors stated:

there is no clear evidence on the kind of variations in production techniques that significantly contribute to learning from instructional television. However, students will learn better when the visuals are presented in a continuous order and carefully planned both by the television team and the study teacher. (p. 26)

Barbatsis (1978), citing Kumata's 1960 study in a study for Children's Television Workshop, concluded that "the mode of presentation significantly affects learning" (p. 409). Finally, in Empirical Studies of Television Composition, Metallinos (1980) said, "the failure to recognize the key differences between the media of film and television is a major reason for the lack of empirical research in television composition" (p. 1).

Comparing Learning With Television to  
Learning With Other Methods and Media

Comparative studies have been conducted to compare modes of instruction in terms of student achievement. These studies most frequently have compared television with some other medium, usually a live lecture, and then compared the effects of the media on viewer achievement. These studies have been quite numerous. The conclusion in most of these studies has been that no significant differences in achievement exist between methods of instruction or between media in which the course is presented (Carpenter & Greenhill, 1958; Kumata, 1960; Lepore & Wilson, 1958).

The list of comparative studies cited in this review is representative rather than comprehensive because the studies were so numerous and did not reflect the major emphasis of this investigation. An ERIC search was conducted and over 50 studies were reviewed. Other reviews of literature were examined to help identify those studies considered to be most noteworthy. The overall conclusion reported in these studies was that no significant differences in learning, as measured by achievement, existed between the television recording of a lecture or the live lecture itself.

Published research investigating the differences in media with regard to television instruction began as early as 1955. Carpenter and Greenhill (1958) at Pennsylvania

State University measured what they described as the value of a closed-circuit television course versus a conventionally taught course with regard to student achievement, student attitudes, and cost of production. This project, known as the Instructional Television Research Project Number One, was conducted before the widespread use of video tape; therefore, all presentations were live. One presentation was viewed directly with television equipment present; one presentation was viewed via television; and one presentation had no television equipment present in the room. The results indicated that no significant differences in student achievement occurred among the groups, although the authors concluded that direct instruction proved slightly more effective. The authors also concluded that student reaction to televised instruction was neutral and that moderate videcon (television) equipment was adequate (Carpenter & Greenhill, 1958).

In 1954, a course called "Food Service Activities in the United States Army" was telecast over television station KUHT. Forty-seven Reserve Officer Training Corps (ROTC) students received the instruction via television and 60 ROTC students received face-to-face instruction. Allen (1954) found no significant difference between the face-to-face and the televised instruction. The study was conducted for the Quartermaster Training School and published in Kumata's

Inventory of Instructional Television Research in 1956 and in The Impact of Educational Television (Kumata, 1960).

After reviewing several studies at the Conference on Teaching in Colleges and Universities (1957) at Pennsylvania State University, the conference members concluded that no significant differences occurred, in studies that involved over 3000 students, between methods of instruction in various college courses. The evaluators revealed, however, that immediate recall in social sciences was significantly better in several non-television groups as compared to television groups, although they did not say by how much. They questioned the reliability in a statement that suggested that the "instruments may be inadequate and a more precise measurement is necessary" (Conference on teaching in colleges and universities, 1957, p. 2).

Lepore and Wilson (1958) expanded comparative analysis to include instructional television viewed at home. Again, no significant differences were found in the mean achievement scores of students who received television instruction at home, television instruction on campus, or conventional on-campus instruction (Lepore & Wilson, 1958).

Kasten and Seibert (1959) found significant differences in student achievement between students receiving face-to-face instruction and students receiving televised instruction on four of 13 achievement tests. The

study compared 49 instructional television (ITV) students to 54 face-to-face students, and scores were found to be significantly higher for the face-to-face students at both the .05 and .01 level. Because of the small sample, only 59 students in the experimental group, the variations between student scores may have been high, and because of the lack of statistical data about the test instrument, the reliability of this study was questioned.

Kumata (1960) conducted one of the most often cited instructional television experiments, which was published in Schramm's The Impact of Educational Television. Kumata's analysis, "Two Studies in Classroom Teaching by Television," had three major intentions: "(a) present a class where the presentation was predominately visual (training aids), (b) assess feasibility of teaching advertising by television (solution to large class enrollment problems), (c) give experience to instructors in teaching over television" (p. 151-152). Three sections of a junior level advertising course were analyzed. In the first experiment the face-to-face group received significantly higher scores of achievement than the television group. In view of the significant differences favoring the face-to-face group in experiment one, the experiment was repeated using the same televised materials and instructor. When the experiment was repeated, no significant differences were found in

achievement between the two groups. The frequent citing of these experiments may be due in part to these contradictory findings. These contradictory findings suggested that further study was needed.

In an experiment conducted by Danielson and Stauffer (1972), a comparison was made of student performance on a nationally normed test of those students who received instruction via television with those students who received instruction in a lecture section of "Principles of Economics." Three hundred and five television students and 160 lecture students were divided as follows: (a) three television sections used a standard textbook, (b) five television sections used a standard textbook plus a programmed instruction book, and (c) one large non-television lecture section used the standard text. A multiple regression procedure was used to determine whether or not there was a significant difference between group means of achievement.

The results indicated that the national norm scores were significantly higher than those of the lecture and television groups and that the lecture group scores were significantly higher than the television groups. The authors concluded that this particular television course "appears to be less effective than other methods of teaching" (Danielson & Stauffer, 1972, p. 104). Although



not unique to this study, students in the television sections did suffer from several deficiencies: (a) television students could not ask questions; (b) television teaching assistants were inadequately prepared; and (c) television course objectives taught a few concepts thoroughly, but "the inclusion of indifference curve and isoquant analysis probably distracted from student achievement on the standardized test" (Danielsen & Stauffer, 1972, pp. 104-105).

Other studies since Danielsen and Stauffer (1972) have reported conflicting results under various conditions. For example, Waechter (1973) investigated the teaching of community college health education in the classroom versus instruction by broadcast television. The classroom students in this experiment performed significantly better on measures of achievement than the "at home" television students. But Tien (1974) compared the effectiveness of a teletutorial method of instruction with a conventional lecture method and found no significant difference in achievement between the teletutorial group and the lecture group. Further, Hegar (1977) compared an "on campus" Introduction to Business class with an open circuit telecourse Introduction to Business class. The telecourse was offered in four community colleges in a multicampus district. The results indicated that the mean achievement

scores for the "open circuit" television group were significantly higher than for the other groups.

Finally, in "A Case Study in the Use of an Instructional Development Model to Produce and Evaluate an Instructional Television Program," Parer (1977) chose to investigate the recall among special education teachers of information about how to select curriculum packages. In this study, the learning achieved from a television program was measured against the learning achieved from a printed article containing the same information. The results disclosed that participants who viewed the television program learned significantly more than those who read the article. Interestingly, those who read the article and viewed the program did not learn significantly more than those who just viewed the program.

Measuring the Effect of Variations in Television  
Production Techniques and Values on Learning

Most of the early studies that measured variations in production techniques or improvement in production values began by investigating the application of specific techniques in the medium of motion picture film. Although the methods employed and tested can be recreated in television, or for that matter the film itself can be presented with the use of television equipment, these experiments were not direct television application. Empirically based studies conducted with film to determine

instructional effectiveness were included to provide a review of several production techniques used in the current study. These techniques were compatible with both film and television capabilities and were useful for identifying the elements that have been combined for this study.

In 1951, Lumsdaine, Sulzer, and Kopstein conducted an experiment for the United States Department of Defense to measure the influence of television animation techniques on the effectiveness of training films. The simple animation techniques used included pop-in labels and moving arrows. The study reported that among 1300 Air Force trainees, the group that viewed the animated films showed significantly greater achievement than those who saw the non-animated films. Although a statistical analysis was conducted for this study, the failure to report the methods of control, including the size of the groups, severely affected the reliability of the results.

Neu (1951) began a series of film experiments at Pennsylvania State University measuring film effectiveness on achievement. Neu (1951) tested the effects of visually relevant and visually irrelevant attention-gaining devices on learning among 2631 Army and Navy recruits. Neu (1951) concluded that attention-gaining devices which provide no additional information do not increase learning. Although the reporting of statistical information was limited in this

report, the conclusion supported the contention that television production techniques need to be related to the content of the presentation to have an effect on achievement.

A year later, Mercer (1952) supported Neu's finding in a study for the United States Naval Special Services Center. Mercer (1952) tested the effect on achievement of optical effects, dissolves, wipes, and zooms, that had been inserted between scenes in a film production. Using an analysis of co-variance and a sample size of 972 recruits, Mercer (1952) found no significant differences in recruit achievement. No further information about this study has been located.

In a doctoral dissertation at the University of Nebraska, Vestal (1952) compared achievement scores of high school physics students who viewed animated films and high school physics students who viewed direct photography films within an instructional setting. Again, no significant differences in achievement were found. However, the study reported a failure to use comparable classroom instructional methods in each test group and a failure to maintain strict control over the number of times each film was shown. This lack of control seriously limited the reliability of the research results reported by the Vestal (1952) study.

In 1953, the evaluation of training films for the United States military continued with a most bizarre study. Vandermeer (1953) compared the effect on learning and attitudes of two films that used different techniques to influence personal hygiene knowledge and habits. A dramatic type film which employed a singing commercial method was compared with a lecture type film. A personal hygiene information test was given following the presentation of each film and a chi-square analysis was used to measure significant differences in the distribution of the results. No differences in learning or in attitudes about the material presented were found. That was not the only measure used. Observers were designated to monitor the hygiene behaviors of the 176 recruits. The conclusion reached was that neither film, with the accompanying instructions, changed the observed personal hygiene behavior of the men to any significant degree.

In 1954, Vandermeer tested another production technique in film that reflected the technical achievements of television during that time. Vandermeer (1954) studied the effect on achievement of using color films instead of black-and-white films. Both films had the same content. A multiple-regression analysis was used to isolate significant differences. Verbal and non-verbal tests were used to measure achievement both for immediate and delayed recall.

Both color and black-and-white films produced learning. No significantly greater achievement on the immediate recall tests was demonstrated by the color films, but recall scores at the end of six weeks were significantly higher for three of the five color film groups. Regardless of significant differences reported in the delayed results, Vandermeer (1954) concluded that the use of color film did not seem to be justified in terms of greater achievement. Moreover, Vandermeer's (1954) test results lack applicability when compared to current state-of-the-art television.

Two other production techniques which proved more useful were evaluated by McIntyre (1954) for the United States Naval Special Devices Center. The purpose of this study was to measure the effect on achievement of humorous elements and subtitles in a training film on the use of cold weather uniforms. In the study, two treatments were prepared. In one production humor was used, and in the other sub-titles were used. Achievement results were compared to a control group. In the film presentation that the control groups saw, blank leader (blank film) was inserted in the production where the humor and subtitles occurred. Six experimental groups were chosen at random from 426 trainees. The reported results indicated that significantly more learning occurred from the film with titles rather than from the film with a humorous approach or

from the film which had neither the humorous approach nor the titles.

These were the studies of the early 1950s. These studies were interesting but only marginally useful in the development of the present experiment. The medium tested in the studies conducted up to this point was film, but the variables, without regard to validity, are relevant to the medium of television today. In the studies that follow, additional variables were identified and were tested specifically with television.

In 1958, Carpenter and Greenhill conducted two frequently cited television studies at the Pennsylvania State University. These studies were titled Reports 1 and 2, "An Investigation of Closed-Circuit Television for Teaching University Courses Report." Both studies were predominantly characteristic of the comparative studies reported in the third section of this review of literature. Report Number 2, however, did contain two experiments designed to measure the effect of television production techniques on achievement. Both experiments, one in air science and one in psychology, were identical in nature and were designed to measure the difference in achievement scores between two methods of television presentation. Both presentations were lectures; however, one employed the use of prepared visuals while the other relied on the chalkboard

as the sole visual component. The first experiment was conducted with 710 air science students and the second was conducted with 191 psychology students. Both experiments were analyzed using analysis of variance procedures. In the air science experiment, significantly higher scores prevailed in the lecture/chalkboard group. In the psychology experiment, no significant differences in achievement were found. Several conclusions were presented by the authors and included (a) students need to learn how to learn from visuals; (b) visual media need visual tests; (c) the method of presentation is unimportant (Carpenter & Greenhill, 1958). In criticizing the presentation, the authors stated, "it is possible that much more radical changes in course presentations will have to be devised before differences will emerge when comparisons are made with traditional methods" (p. 65).

Kazem (1960) evaluated the effect of adding films to a lecture presentation in a Detroit high school biology class. Using several t-tests, Kazem found that students in three experimental groups had significantly higher posttest scores than students in the control group. He also found that students viewing an informational-expository film had significantly higher scores on the posttest, designed to test knowledge of scientific methods, than students viewing the historical-dramatic films. However, the



information-expository group had no higher scores than students in the combination information-expository and historical-dramatic treatment. There were no significant differences among overall posttest scores of students in any of the three experimental groups.

Finally, Rock (1969) conducted a test designed to measure learning and retention from a television presentation. In this case, the value of instruction by television was measured against a written presentation. That is, the so-called control group was given the material to read but received no expository presentation. Three thousand reservists took part in the experiment. Rock (1969) concluded that the methods were equally effective. Before the experiment, all participants were allowed to see the questionnaire used for the evaluation; therefore, the experiment introduced another variable. Lack of reported statistical details indicated that the study may have been uncontrolled and poorly designed. In addition, the study did not discuss the comparison of television effectiveness with the effectiveness of other media.

Barrington (1972) conducted a study of greater specificity. The study compared two versions of a prerecorded program: realistic presentation versus precompression of information. These versions presented one program which approximated reality by showing pictures and

demonstrations, while the other used diagrams and charts to present the concepts. The study involved a sample of 327 college of education students. Significance was found with regard to two hypotheses: (a) a scientific laboratory setting was less effective than gray curtains as a background, and (b) cine films with commentary were less effective than animated diagrams.

From these results Barrington (1972) concluded that "simple sets will be more effective than sophisticated sets and diagrams and models will be more effective than photographs and films" (p. 190). These conclusions may not be an accurate analysis of the results but, Barrington goes on to say that "further research aimed at improving instructional television programs should be undertaken (and) more information is needed about the effectiveness of presentation" (p. 90).

In an unpublished dissertation at Auburn University, Davis (1979) sought to measure retention as related to arousal in film and television. If arousal would have created a state of attention in the learner, then a valuable study might have been undertaken to measure the effects of the methods of gaining arousal. However, in this study, the arousal stimulus was unrelated to the subject to be learned. An action segment from the commercial television program "Battle Star Galactica" was inserted in a film on house

construction. A multifactor analysis of variance was used to determine the main and interaction effects of high-and-low-arousal films as measured by a nineteen question visual and verbal test given immediately after viewing and again one week later. According to Davis (1979), significant differences were found consistent with those found in previous studies on arousal. The effect of the interaction of the time interval of the arousal stimulus on retention was significant at the .05 level; however, the arousal retention phenomenon was not clearly demonstrated because the use of arousal techniques did not significantly increase long-term retention (Davis, 1979). The fact that the arousal clips were unrelated to the subject of instruction may have contributed to the insignificant results.

A study conducted in 1981 by Morris (1984) was designed to measure and compare achievement between groups of undergraduate students receiving economics instruction by two different television presentations. The original method depicted the instructor, in typical "talking head" fashion, using a chalkboard to present visuals and to discuss the conceptual relevance of the consumption function. The second method used "pop-in" animation over the entire videotape. Moving diagrams, high contrast graphics, scenarios, and contemporary music were used in the portion

of the videotape dealing with the relevance of the content matter. The instructor was visible, but less often, in this version (Morris, 1984).

Both tape presentations were shown to two groups of students enrolled in an economics class at the University of Florida in the Spring 1981 term. Following the viewing, student achievement was measured and then compared (N=197). An analysis of covariance and an unbalanced analysis of variance were used to measure significant differences between the groups on the overall posttest; a t-test was also used to measure the significance of scores on two particular questions designed to measure the relevance of the content matter that was presented. The results indicated that significant differences occurred on measurements regarding two relevance questions. No significant differences occurred on the overall exams, which included factual material and calculations (Morris, 1984).

The results of this study indicated that only modifying the standard "talking head" lecture/chalkboard presentation by adding preproduced graphics and "pop-in" animation did not necessarily improve achievement. However, replacing the lecture sequence, which dealt with the relevance of a topic, with preproduced segments which incorporated high production values, on-location vignettes,

freeze frames, and animated moving graphics did improve achievement (Morris, 1984).

The results of the Morris (1984) study were based on a single execution, so further study was recommended. This study included a one item preference survey which indicated that of those who saw the modified tape, 66% preferred it to the usual talking-head videotape. Eighteen per cent, however, did not prefer the modified tape (Morris, 1984). Could these results be repeated? Did the attitude of those students who did not prefer the modified tape affect the results? If the production techniques which produced negative attitudes about the treatment tape were identified and eliminated, would the results be a further improvement in achievement scores?

Applicability has been shown between these studies designed to measure variations in television production techniques and the present study. The most significantly consistent conclusion, which was applicable to this study, was that more research was needed.

#### Summary

There are several conclusions which can be drawn from summarizing the studies reported in this section. The conclusions and summaries stated here have been made as a result of this review.

1. Instructional development models provided some direction for general media application, but no model was found that addressed television production directly. How motion, slow motion, magnification, and the other attributes of the video component can best be used to present the instructional message needs to be addressed through the development of a television production model.
2. Of the 12 studies reviewed, which compared television instruction to other forms of instructional presentations, six revealed no significant differences and six revealed differences in achievement. (Four studies favored face-to-face instruction, and two favored television instruction.)
3. The two studies favoring television instruction were more recent (1977) than any of those favoring face-to-face instruction.
4. All but four of the studies designed to measure the effect of television production techniques on achievement were conducted before 1960.
5. One of the studies designed to measure the effect of television production techniques on achievement (Kumata, 1960) revealed conflicting results when repeated. The first experiment favored the chalkboard instruction, and the repeated experiment resulted in no significant

differences between the chalkboard and animated characters.

6. Of the three production values studies conducted since 1960, two experiments, Rock (1969) and Davis (1979), may have measured unrelated variables. Rock compared television instruction with no instruction and did not compare television to other media, while Davis (1979), in measuring retention related to arousal, used arousal clips unrelated to the subject of instruction.
7. In the Danielsen and Stauffer (1972) study and the Waechter (1973) study, face-to-face instruction was favored, but many factors outside the experiments could have influenced the results. Danielsen and Stauffer (1972) reported several deficiencies, including inadequately prepared television assistants. In the Waechter (1973) study, broadcast television was used as a method of delivery. This situation introduced uncontrolled variables including (a) at home viewing, (b) limited inter-student contact, and (c) reception difficulties.
8. The experimental results found in the Morris (1984) study are based on one execution and therefore the experiment needed to be repeated. Moreover, an attempt to identify and eliminate some of the production

elements which students found unnecessary or distracting would be helpful.

The trend in comparative studies, as measured by achievement, has been to reveal no significant differences between television and other methods of presentation. The effectiveness studies for television have been too few and most were conducted when the medium was less technically sophisticated. As a result, little significance was achieved in studies measuring learning from television. Barrington (1972), in what might be the most comprehensive television effectiveness study ever conducted, concluded that "further research aimed at improving instructional television should be undertaken" (p. 190). This study attempted to follow up on that recommendation and on the findings in the Morris (1984) study by developing and testing the effectiveness of a completed producer's model. Three different evaluation strategies were combined in this research to determine the effectiveness of the new model and to suggest methods for continually improving televised instruction at the college level.



## CHAPTER 3 METHODOLOGY

### General Research Design

The purpose of this study was to analyze and compare the effects of a segment of televised instruction that adhered to elements of a producer's model with a camera of record (nonmodel-developed) segment of televised instruction in a college course. Both quantitative and qualitative methods of evaluation were used to conduct the analyses and to make the comparisons.

First, a qualitative analysis of a producer's model for designing televised instruction was conducted using a survey questionnaire. A description of a producer's model together with a questionnaire was sent to a select group of telecourse producers. These producers were asked to analyze the model by addressing its perceived usefulness in developing telecourses and for training telecourse producers.

Second, a qualitative focus group evaluation was used to analyze and compare televised instruction that adhered to elements of a producer's model with a camera of record (nonmodel-developed) videotape. Two groups of respondents were asked to watch the control and treatment videotapes from the 1981 Morris experiment (Morris, 1983) and to note specific instructional techniques that they perceived to be effective or ineffective.

Third, a 1985 experimental design was used to analyze and compare test scores of economics students who viewed three different versions of televised instruction. One 1985 college economics class section was shown a 1985 camera of record (nonmodel-developed) presentation and served as the control group. This tape was 46 minutes long. Another section was shown televised instruction that adhered to elements of a producer's model, a modified version of the 1981 Morris (1984) treatment tape. The only modifications that were made to this 1981 treatment tape were to eliminate 10 minutes of material no longer covered in the economics course in 1981. This tape, which was 43 minutes long in 1981, was reduced to 33 minutes in 1985 and labeled treatment tape one. This section served as treatment group one in this, the 1985 experiment. A third section was shown another version of televised instruction that adhered to elements of a producer's model but that had been revised to exclude the production technique of using music/drama that the two 1985 focus groups found ineffective. This tape was 33 minutes long and labeled treatment tape two. This section served as treatment group two in the 1985 experiment.

In order to maintain strict control of the experiment without disruption of the three class sections due to randomization, a quasi-experimental design was used. A non-randomized control group, pretest-posttest design was

used to include a covariate and to measure significant differences on the posttest. The independent variables T1 and T2 were the experimental treatments, X was the pretest, and Y was the posttest.

Group	Pretest	Independent-Variable	Posttest
E1	X	T1	Y
E2	X	T2	Y
C1	X	-	Y

#### Design of the Treatment

For the purpose of improving a televised instruction production and thereby improving achievement and learning, this experiment used a cumulative approach in developing the treatment. When Schramm (1977) analyzed the Chronbach and Snow aptitude treatment interaction (ATI) studies, he found that "there are many characteristics of the learner that interact and alter the effects for different individuals--more such characteristics than any experimenter is likely to be able to control, more than he is able to know about" (p. 40). This experiment did not attempt to isolate or control for these variables but was designed to maximize the attributes of televised instruction by increasing the overall production values of television and ultimately gaining the attention and interest of the college students involved (Gagne, 1980). All of the production techniques in the two treatment videotapes were created in accordance with the specifications of a producer's model for

televised instruction and were designed in conjunction with the 1981 experiment by Morris (1984). The Producers' Instructional Television (PITV) Model was developed from this study to exploit the three principal functions of television production: looking at, looking into, and creating an event (Zettl, 1984). A visual depiction and description of the PITV Model can be found in Chapter Four. The model is divided into three key sections: (a) the presentation of facts and methods, (b) the illustration of relevance or applicability of those facts and methods, and (c) the evaluation of the product. A description of how the PITV Model was used in the design of the treatment (model-developed) videotapes can also be found in Chapter Four.

For the 1981 experiment and again for this study, Dr. David Denslow of the College of Business at the University of Florida, consulted with this experimenter on the development of the control (nonmodel-developed) tapes and the treatment (model-developed) videotapes. Dr. Denslow's, Economics 2013 class, Principles of Economics, is delivered to over 1500 students a semester, most of whom see it in a telecourse format. The usual televised instructional presentation consists of the instructor presenting information with the use of a chalkboard. This has been the extent of the production. All diagrams, definitions, and tables have been written on the chalkboard by the

instructor. The relevance of terminology and econometrics presented during the first part of each lecture has been summarized at the conclusion of each televised lecture by the instructor, again using only the chalkboard for illustration.

A 46 minute camera of record videotape, made in January of 1985, served as the control (nonmodel-developed) videotape for this study. Two treatment tapes were also developed in January of 1985. Treatment tape one was a 33 minute revised version of the model-developed videotape from the 1981 study by Morris (1984). This tape was revised to exclude material no longer covered in the course but otherwise was unchanged from the 1981 experiment. In the first 30 minutes of treatment tape one, when the instructor talked about diagrams, definitions, and tables, the chalkboard was replaced by high contrast graphics on a blue background that popped on the screen in a method known as "pop-in" animation. In addition, arrows and boxes were used to further highlight the points of interest. The instructor was visible, but less frequently in this treatment tape than in the control tape.

In the first 30-minute section of treatment tape one, the audio and structure of the tape was unchanged from the control tape. In the remaining portion of treatment tape one, the audio, video, and structure of the presentation were changed in accordance with the "relevance illustrated"

portion of the PITV Model, removing the instructor entirely. In an attempt to improve achievement, a 10-minute discussion of the relevance and meaningfulness of the terminology and econometrics by the instructor in the end of the control (nonmodel-developed) videotape was replaced on the end of treatment tape one by a three-minute scenario designed to accomplish the same task in a more effective manner. This scenario consisted of (a) dramatizations of consumer activity depicting consumers at check-out lines, (b) animated charts showing movement along and movement within a graph, (c) newspaper clippings highlighting various economic activities, and (d) contemporary music with the theme of money.

Treatment tape two was a revised copy of treatment tape one. It was revised in January of 1985 to fit the recommendations of two student focus groups. The focus groups reviewed both the control tape and the treatment tape from the 1981 experiment in January of 1985. Treatment tape two was constructed in accordance with the procedures of the PITV Model for using focus group information to further improve televised instruction. Feedback from the focus groups was used to revise treatment tape one and thereby create treatment tape two, by eliminating from the scenario (a) dramatizations of consumer activity depicting consumers at check-out lines and (d) contemporary music with the theme of money.

### Instruments

A five item open-ended questionnaire was used to survey a panel of five expert telecourse producers. In addition, an interview schedule was used to facilitate two focus group interviews. Finally, as a test instrument, one 12-item multiple choice exam was used to measure student achievement. The instrument was a posttest given after the showing of the treatment and control tapes.

The cover letter and open-ended questionnaire that was given to the panel of experts was designed to secure opinions about the PITV Model from the experts (see Appendix A). The experts (see Appendix B) also were given a copy of the PITV Model (Chapter Four) and asked to make suggestions for improving it.

Focus group interviews have been a qualitative method of evaluation for some time (Merton, Fiske, & Kendall, 1956). The investigator followed an interview schedule (see Appendix C) to facilitate open discussion among the focus group interviewees utilized in this research. An audio and video tape recording was used to collect student responses during two focus group sessions. The information was then analyzed by the investigator to provide recommendations for improving treatment tape one. The interview process included questions with the following characteristics (for examples see Chapter 5):

1. Questions referring to the process of retrospection (questions 6 and 8).
2. Questions including reference to the stimulus situation (questions 7, 9, and 10).
3. Verbal cues to past response (question 11 plus all probing stimulators).
4. Questions to control loquacious interviewees.
5. Questions to activate reticent interviewees (all probing questions).
6. Questions that extend coverage to the group (all probing questions). (Merton, Fiske, & Kendall, 1956)

"An item-by-item comparison between the results of a qualitative study and a quantitative study shows the validity of focus-group findings" (Reynolds & Johnson, 1978, p. 21). The findings in this part of the research were not used to establish strong causal links between the television production techniques and student achievement, but rather to provide feedback about the quality of the control and treatment tapes from the 1981 experiment and to identify any unnecessary production techniques used in the 1981 treatment tape.

A 12 item posttest was constructed from a pool of 24 objective test questions written and used by Dr. Denslow. Dr. Denslow had analyzed all of the test items over several semesters using the system of item analysis provided by the



Office of Instructional Resources at the University of Florida. In addition, the posttest was examined for reliability using the KR-20. A composite item analysis was performed for all twenty-four items in the pool. The analysis coefficient was .61. This result indicated that the test items provided reliable predictive results for measuring changes in student achievement. Moreover, this coefficient indicated that there was room for improving achievement (Morris, 1983).

Identical posttest instruments were given to the control group and the two experimental groups. The instruments were presented in the last 10 minutes of the instructional period by the experimenter.

The posttest was the major test instrument used in this experiment and was identified as the measure of student achievement. It was administered immediately following the television presentation in both the treatment and control groups. The posttest consisted of 12 multiple choice items (see Appendix D). All items pertained to the Consumption Function, the major content presented in the three videotapes. All of the questions were used to measure the recall of material from the entire 46 minutes of control tape and 33 minutes of the treatment tapes. Three of the questions (items 5, 8, and 12) were designed to measure understanding and meaningfulness of the Consumption Function, covered in the last 10 minutes of the control tape

and the last three minutes of the treatment tapes. The respondents were required to relate movements along, or shifts in, the Consumption Function to consumer behavior. This was the portion of both treatment (model-developed) videotapes that provided a complete departure from the control (nonmodel-developed) videotape and represent the "relevance illustrated" portion of the PITV model developed for this study.

### Selection of Subjects

A panel of five experts (see Appendix B) was selected from a list of expert telecourse producers provided by Research Communications, a telecourse research firm, and by Dr. Kenneth Christiansen, a member of the committee supervising this study. The selection process consisted of a telephone interview of seven potential evaluators to determine who was the most likely to complete the survey.

Two focus groups were used to determine perceived differences between the 1981 control (nonmodel-developed) videotape and treatment (model-developed) videotape and to determine what production techniques were unnecessary in the 1981 treatment tape. One focus group consisted of five students who had taken the economics course that was examined in this study. The other group consisted of five students who had not taken the course. The subjects for the first group were selected from students enrolled in Principles of Economics (2013) in the College of Business at

the University of Florida in the Fall of 1984. The class role<sup>1</sup> was examined to obtain a mixture of students according to their final grades in the class. An attempt was made to obtain an even distribution of students with grades from A through D. The subjects for the second group were selected from students enrolled at the University of Florida in the Spring of 1985 who had not taken Principles of Economics (2013). A list of volunteers was obtained from an Introduction to Advertising course. Token gifts--donated by three local merchants and consisting of portable radios, coffee mugs, tee shirts, and assorted toiletries--were used to encourage students to participate. All participants received an assortment of gifts.

All of the subjects for the experimental evaluation in the study were selected from the 1575 students enrolled in Principles of Economics (2013) in the College of Business at the University of Florida in the Spring of 1985. The students select their sections during registration either from those sections available or from those that best fit their own schedules. The live lecture, from which the 1985 control tape was recorded, was presented in a large lecture hall at 8:00 a.m. on the day of the experiment. The 1985 control (nonmodel-developed) and two treatment (model-developed) videotapes were shown about midsemester in three television classrooms consisting of approximately 50 seats and one or more television monitors.

Three Economics 2013 sections were selected as the sample for this experiment to obtain sections of approximately equal size. One section served as the control group and two served as the experimental groups. The total sample size was 113, with 57 in the control group, 31 in treatment group one, and 25 in treatment group two.

#### Collection of Data

The results of an earlier study by Morris (1984) were examined for further inquiry and development in the Summer of 1984. Although the data showed that significant differences in student achievement had occurred in a telecourse when television production values were increased, the results of a single trial did not seem conclusive. Furthermore, no formalized model existed for use in telecourse development, thus inhibiting others from obtaining significant improvements in the effectiveness of a telecourse production as found in the Morris (1984) study.

In October of 1984 a model was fully developed from a rough outline used in the television production for the earlier Morris (1984) study. The procedures and processes were described and a diagram of the model was constructed. The model was called the Producers' Instructional Television Model (PITV).

Since the purpose of the original study was to find methods for improving the effectiveness of the television production in a telecourse (Morris, 1984), formative and

summative evaluation processes were incorporated in the PITV Model. After the proposal for this study was accepted in December of 1984, the first formative evaluation process was begun. Copies of the model, together with a five item open-ended questionnaire, were sent to five expert telecourse producers. Although data collection from this evaluation was scheduled for January 1985, all of the data were not received until late February of 1985.

A second formative evaluation process was begun in January of 1985. Data from a focus group analysis of the control and treatment tapes from the 1981 Morris (1984) study were gathered. The results were used to modify treatment tape one and thereby construct a second treatment tape, treatment tape two.

In the spring of 1985 data were gathered from a summative evaluation of the control and the two treatment videotapes. In the experiment, student achievement scores on the posttest for treatment tapes one and two (model-developed) were compared to the scores of students who viewed the control (camera of record) videotape. An analysis of covariance (ANCOVA) was used to compare achievement test scores and to match those scores with previous test results for those students in the sample.

#### Analysis of Data

This study involved the establishment of research questions to be answered and hypotheses to be tested using

the appropriate statistical methods. Do experts, who have been asked to evaluate a producers' model, find it useful for producing televised instruction? To analyze the information provided by the expert telecourse producers, their comments were summarized and compared to the results of the focus group and experimental evaluations for consistency. The experts' opinions on the usefulness of the model were compared to (a) the opinions of the focus group about the quality of the model-developed tape, and (b) the achievement scores of the students who viewed the treatment tapes. These data were then used to make recommendations for improving the model. In addition, the researcher commented on the quality of the evaluations provided by the experts.

Does information and feedback provided by a focus group suggest methods by which model-developed televised instruction might be revised and further improved? To analyze the information of the "qualitative" focus group evaluation, the interviews were summarized by interview question (see Appendix C) and transferred into recommendations for improving treatment tape one. Since focus group evaluation is a qualitative form of evaluation, the summaries were focused around the strength of the arguments rather than the number of participants who responded. If a student or students felt strongly about an issue, it was noted in the summary. The focus groups were

held in the research observation lab in the College of Journalism and Communications and were videotaped and audiotaped for thorough analysis and review. The focus group responses were analyzed for range, specificity, depth, and personal context (Merton, Fiske, & Kendall, 1956, p. 12). Using these criteria, the revision of the 1981 treatment tape was based on the strongest argument.

Hypothesis 1. There were no differences in student achievement between students who viewed model-developed televised instruction and students who viewed nonmodel-developed televised instruction. To analyze the data of the achievement evaluation related to this hypothesis, an ANCOVA was used (a) to investigate the possible interactions between a previous test and the posttest, or to measure for the effects of prior knowledge; (b) to measure differences in cumulative mean achievement on the overall posttest between students who viewed treatment tape one and students who viewed the control group; and (c) to measure differences in cumulative mean achievement on the three posttest items measuring understanding of the consumption function, and related to the "relevance illustrated" portion of the model, between students who viewed treatment tape one and students who viewed the control group.

Hypothesis 2. There were no differences in student achievement between students who viewed model-developed televised instruction and students who viewed model-developed televised instruction with a selected production technique deleted. To analyze the data of the achievement evaluation related to this hypothesis, an ANCOVA was used to measure differences in cumulative mean achievement on the three posttest items measuring understanding of the consumption function, and related to the "relevance illustrated" portion of the model, between students who viewed treatment tape one and students who viewed treatment tape two.

The criterion for accepting or rejecting the hypotheses was a confidence level of .05.

#### Anticipated Findings

If this study was to be ecologically significant and to contribute to the creative production process of televised instruction, it needed to be formative rather than summative in nature. The research conducted by the Children's Television Workshop (CTW) in the design of "Sesame Street" (Barbatsis, 1978) may be categorized as formative. The CTW research was designed to uncover "information for improving a product or practice" (p. 400).

Guba and Lincoln (1981) said that educational evaluation should be used for course improvement. "As Cronbach put it: Evaluation used to improve the course while



it is still fluid contributes more to the improvement of education than evaluation used to appraise a product already on the market" (Guba & Lincoln, 1981, p. 8).

The method chosen for this study was consistent with the approaches used in formative studies. Instead of comparing the results of face-to-face delivery with a videotape presentation of the same lecture to determine the winner, a comparison of two videotape presentations containing the same information was conducted to determine methods for improving televised instruction.

The expected results were as follows:

- 1) The expert evaluations were expected to point to methods for further improving the PITV Model and to make it more effective for future users.
- 2) The focus group interviews were expected to point to methods for further improving the production techniques used in the 1981 treatment tape.
- 3) Student recall of terminology, statistical processes and diagram construction, as measured by achievement scores, was expected to improve as a result of substituting television special effects, pop-in animation, and moving arrows for a chalkboard in the treatment tapes.
- 4) Student achievement was expected to improve as a result of preproduced demonstrations, similar to television commercials, that maximized affective appeal and used

- 55 -

animation, concrete and abstract examples, scenerios, and relevant contemporary music.

## CHAPTER 4 PRODUCERS' INSTRUCTIONAL TELEVISION (PITV) MODEL WITH EXPERT EVALUATION

The experimental or treatment tapes for this study were developed using the Producers' Instructional Television (PITV) Model. The experimenter designed the Model, and the 1981 and 1985 treatment tapes, to increase the effectiveness of televised instruction through the use of television production techniques. The PITV Model and the relationship to the treatment tapes can be found in the first section of this chapter.

In order to examine the perceived usefulness of the model to telecourse producers, a panel of experts was established. A questionnaire (see Appendix A) was mailed to experienced telecourse producers (see Appendix B).

Do experts, who have been asked to evaluate a producers' model, find it useful for producing televised instruction? To answer this question, the responses of the experts have been summarized in the second section of this chapter. A consensus on each of the five questions and on the combination of the five questions was used to determine the usefulness of the model.

### The PITV Model

The Producers' Instructional Television (PITV) Model is compatible with most instructional development models which incorporate media as a portion of the model, those

models which include audience analysis as part of the model, and those models that are objective-based. In order to determine the proper prerequisites, these models should be consulted before implementing the PITV Model. The PITV Model should be inserted in the media development section of other instructional design or development models.

The PITV Model is a procedural model which divides the instructional presentation into three basic segments (see Figure 1). Segment One (Facts Presented, Methods Demonstrated) deals with the presentation of terminology, facts, and formulas. In this section, the presentation should focus on developing skills. Segment Two (Relevance Illustrated) should be used for illustrating the relevance of the material presented in the first segment. This second segment should involve more complex production techniques in an attempt to illustrate the meaningfulness of the topic under study. Segment Three (Evaluation) is the evaluation component of the Model. The segment includes one qualitative and two quantitative methods of evaluation.

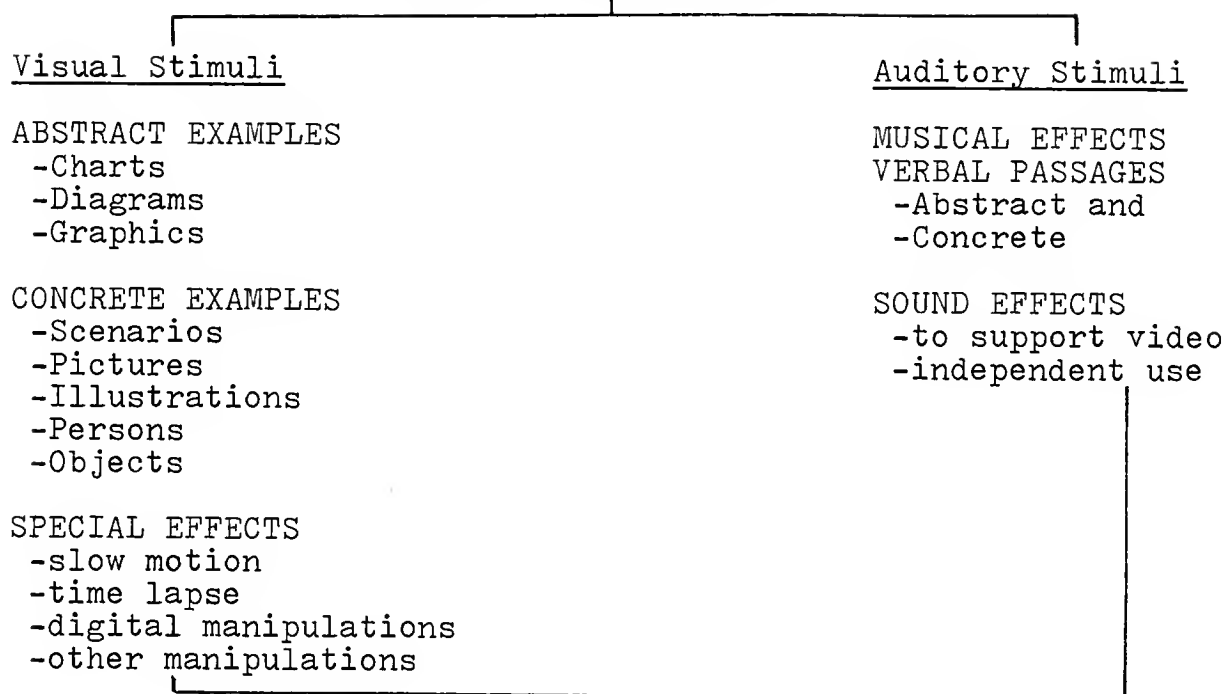
Moreover, the lines running to all segments and subsegments of the Model serve two purposes. They connect the representative segments of the Model, and they indicate the places where transitional devices are needed. The transitional devices (eg., dissolves, wipes, quick-cuts, etc.) assist in holding the viewer's attention while indicating changes in time, location, or mood.

Finally, the electronic facilities--the quality of audio and video reproduction equipment--need to be optimal, given the limitations of the available resources. In order to implement the PITV Model the television facilities must have, as a minimum, the equipment to produce electronic graphics and to edit videotapes. A visual depiction of the model appears on the following page.

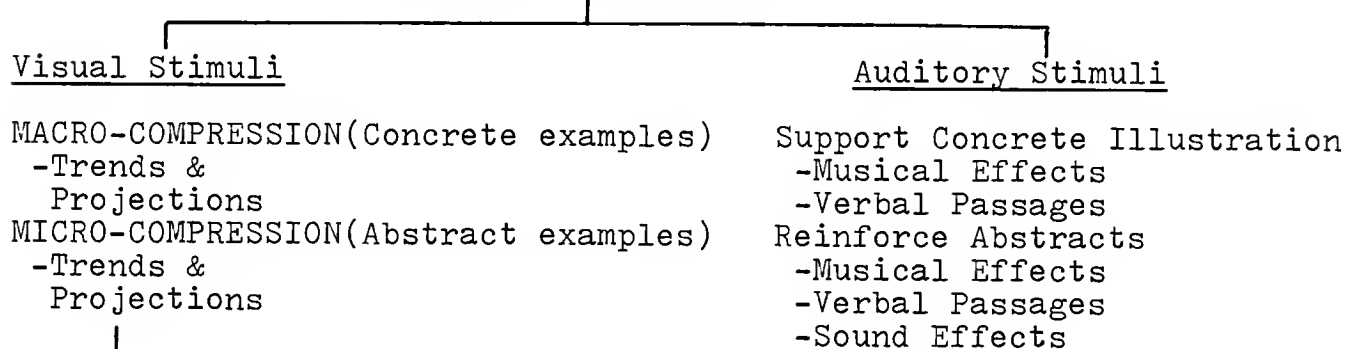
Although the PITV Model is included in this study, the treatment videotapes, as well as the videotape of the focus groups are not. Copies of those videotapes may be viewed at the College of Education Library, Norman Hall, at the University of Florida, Gainesville, Florida. Also, copies of the videotapes and additional information about the study may be obtained from the author. To locate the address of the author, contact the Librarian of the College of Education at the University of Florida, Gainesville, Florida 32611.

For the 'serious researcher,' copies of the videotapes may be found in the Motion Picture Division, MBRS, of the Library of Congress in Washington, D. C., 20504. All of the videotapes have been recorded in the VHS format and copyrighted as part of this study.

SEGMENT 1  
Facts Presented  
Methods Demonstrated



SEGMENT 2  
Relevance Illustrated



SEGMENT 3  
Evaluation

Quantitative Achievement  
Quantitative Survey  
Qualitative Focus Group

FIGURE 4-1. THE PRODUCERS' INSTRUCTIONAL TELEVISION MODEL.

The subject of the televised instruction may be presented at the beginning of the production or videotape as a title. This title may be only a portion of the subject or a premise, depending on the length or amount of material to be covered. The title of the presentation may be presented visually or delivered orally. In some instances, to hold interest, it might be desirable not to reveal the subject or premise. In the treatment tape for this study, a blue background with white letters on the top and bottom was used to identify the subject of the lecture, the Consumption Function. The instructor appeared in a square wipe, inserted in the center of the graphic. When he began the lecture, the graphic was raised up and out of the picture, an effect that resembled a rising curtain.

Once the title is given, the first major section of the Model is employed. The "facts and methods" section is used to define the terms and to demonstrate the processes of the methods. This is the "how-to," skills development section of the production and has been categorized on two levels. The initial level is divided into types of stimuli, visual or auditory. These levels are further subdivided into example types, concrete or abstract, or into supporting production effects. Some knowledge of television production techniques is prerequisite for implementing this section as well as all other phases of the PITV Model. Also, a basic television production text may be helpful for those who wish

to use this Model. In addition, the use of storyboards may provide assistance in the development of the visual component and in the coordination of the video with the audio portions of instruction. To conform with standard television scripting procedures, the visual guidelines have been placed on the left side of the Model and the auditory guidelines on the right side.

The production of abstract examples for both the visual and auditory stimuli includes representations and discussions of charts, diagrams, and formulas. The production of concrete examples includes scenarios, photographs, illustrations, persons, or objects. The ordering of concrete examples after abstract examples is implied here, but a reverse order may be appropriate for some subjects.

The visual component may consist of illustrations or alpha-numeric graphics and may need animation to assist the viewer in making implied connections. Transitional devices, i.e., dissolves, wipes, or special effects, may also be necessary to assist the viewer in making the connection between illustrations. For the presentation of terminology, econometric diagrams, and problems in the treatment tape for this study, the chalkboard was replaced by electronic graphics, using white characters on a blue background. Pop-in animation and visual special effects were also used in this study to construct the graphics, and an arrow was



constructed from a video wipe to highlight important reference points.

The auditory stimuli in the television presentation may include music for support or transition, as well as simultaneously include verbal passages. The verbal passages used in segment one of the presentation should most likely be descriptions rather than dramatic dialogue. They may be abstract and directly related to the visual or concrete and used to cite examples of the abstract visual component. In the treatment tapes for this investigation, the instructor, Dr. Denslow, described the processes of the Consumption Function as they appeared on the screen.

The audio and video components of the presentation may be inseparable or mutually exclusive, depending on the needs of the content material. If scenarios are used, for example, the verbal passages may be an integral part of the visual presentation. In some cases, however, the verbal passage may be a continuous discussion of the facts, while the visual component may present various examples.

Special effects may be used to vary the forms of the visual presentations, i.e., slow-motion, time lapse, close-ups, and sound effects may be used as attention-getting devices, as a highlighter for the visual action, as transitional devices, or when a visual action is difficult to illustrate.

In segment two of the PITV Model, "Relevance Illustrated," the relevance or meaningfulness of the facts and definitions presented in segment one is demonstrated. This segment attempts to show the learner the value of the material presented in terms of its usefulness.

An explanation of what comprises concrete or abstract examples or a listing of the relevant video and audio effects will not be repeated for segment two. All of the conditions and techniques used in segment one apply in this segment with some additional organization and sophistication.

First, the illustrations of relevance must be divided into areas of (1) trends (recapitulation) for those portions which are reviews of the past and (2) projections (future applications) for those portions which deal with analyses of the future. Macro-compressions represent the compression of information into some type of demonstration of a concept. Micro-compression represents the use of charts, diagrams, and graphics as described in the abstract portion of the previous section; however, in micro-compression the presentation is often more elaborate because it includes summaries of data, i.e., trends and projections. Animation and special effects are an important part of micro-compression. These production techniques lead the learner through the compressed data. Activity may be diagrammed and changes in activity may be represented by

moving animation. In addition, concrete and abstract examples may have to be mixed together, employing two of television's most useful qualities, video replay and superimposition. To highlight the identification of a physical process, for example, definitions may be superimposed over a slow-motion replay of the process.

The audio for macro-and micro-compressions may be supportive dialogue, descriptions, music, sound effects, or any combination of the four. The ability to incorporate several audio sources at one time is another strong feature of television.

Second, segment two also focuses attention on psychological, social, and physical needs and wants. This is an attempt to affect influence over the learners through emotional stimuli and thereby enhance learning. The methods of affective appeal include comedy, tragedy, relevance to life, contact with authorities, contact with subjects, interactions, and exploitation of the inherent drama of the subject. The means for creating such appeals include visual effects, sound effects, music, varying camera angles and camera movements, moving animation, characterizations, dramatizations, graphics, and staging.

To summarize the usefulness and purpose of the Consumption Function, in the treatment videotape, a preproduced three-minute package was developed using the PITV Model and inserted in place of the instructor's ten

minute summation. This package consisted of an opening scenerio of consumers in action, animated diagrams depicting the differences between shifts in the consumption function and movement along the consumption function, newspaper headlines and verbal descriptions relating consumer behavior to the diagrams, and contemporary music to hold the learner's attention and to add emotional appeal. The approach used in the treatment videotape was similiar to many television commercials and included several special effects such as video wipes, freeze frames, super impositions, and dissolves to ameliorate the transitions.

Finally, segment three recommends the use of three different types of evaluation: achievement (guided by experimental standards), survey, and focus group. Examples of the use of these three forms of evaluation in analyzing the effectiveness of the PITV Model are discussed in the General Research Design and Instrumentation sections of this study. All three forms of evaluation are recommended in order to determine successful implementation of the Model. The achievement evaluation component is used to measure success regarding learning. The survey is used to determine if the model-developed television presentation is preferred over the nonmodel-developed television presentation. The focus group evaluation is used to determine what attributes the students found in the model-developed television presentation that were missing in the nonmodel-developed

television presentation and to point to what further improvements might be made.

Experts' Evaluation of the PITV Model

Five practitioners in the field of instructional television were identified as experts and asked to assist in the evaluation of the PITV Model. Each expert was sent a copy of the model and a description of how it was applied in the economics experiment. Below is a list of those who cooperated in the evaluation of the model and a summary of their professional backgrounds.

1. Dr. Edward Stasheff, Professor Emeritus, University of Michigan. Educational Consultant to CBS-TV, New York; Writer-Director for WNYE-FM, Board of Education, New York; Director of Educational and Religious Programing for WPIX-TV, New York, Producer of the Living Blackboard, for the Board of Education, New York, Program Associate for NETRC (National Educational Television and Radio Center), Ann Arbor; Director of Production for the first station in Israel, the Instructional Television Center, Ramat Aviv.
2. Donald Johnson, Director of Program Development and Production, WNET-TV, New York. Developed several nationally distributed educational programs.
3. The Nebraska Group. These were three anonymous producers of ITV Services at Nebraska Educational Television Network, Lincoln Nebraska (Note: The responses were provided by Lee Rockwell, Manager of Educational Telecommunications). The three reviewers have seventeen years of combined experience producing and directing ITV materials ranging from elementary through post-secondary levels of instruction.

The responses from each of the reviewers were summarized, paraphrased, quoted, and reported according to

the related question. The five interviewers were identified by last name or group name.

1. Would the model be of assistance to you in a telecourse or an instructional television production? If so, why? If not, why not?

JOHNSON-The model would not be useful to a professional production/broadcast center. The processes described are either somewhat elementary for a seasoned producer or appear to be designed to "translate" lectures into a television format. Telecourses, to be effective, must go far beyond this objective. This model appears to reflect a concept of telecourse which has shown to be somewhat less effective than the most recent broadcast efforts. Perhaps it is a very effective model for closed-circuit presentations. I am not qualified to critique the model from that viewpoint. Rather my comments reflect the needs of television stations and production houses.

NEBRASKA EDUCATIONAL TELEVISION NETWORK-All three believe the model is too simplistic for the type of work that they do on a regular basis. They felt the model might be useful, as an organizer, for beginning producers. The Nebraska producers felt that the PITV Model would be acceptable for use with fact-based material geared at highly motivated learners. One reviewer felt the model was too rigid.

STASHEFF-The model would not be of much assistance to me. In all fairness to Mr. Morris, I should point out that I have been involved in either Educational or Instructional TV since 1945. Therefore, almost everything in the model is something I would use instinctively or habitually, with the exception of Section 3, about which I have more to say below.

2. Are there any parts of the model you find more useful than others? Please explain.

JOHNSON-The model is most useful when, as on page 9, illustrative examples of the techniques are presented. Much of the model becomes unclear through use of inadequately defined concepts such as "Macro-compressions represent the compression of information into some type of demonstration of the concept." The model vacillates between abstract concepts which may be hard for the reader to grasp and superficial descriptions of techniques such as "visual special effects."

NEBRASKA EDUCATIONAL TELEVISION NETWORK-No-The model as it exists does not fit well with the type of work and the level or production the reviewers work with on a regular basis.

STASHEFF-As the co-author of a basic text book on television producing and directing, I found Segment 1 and the Auditory Stimuli listed in Segment 2 rather familiar. I was, however, intrigued by the expression of Visual Stimuli

(in regard to relevance) in that Segment; intriguing and potentially useful. Greater explanation of that area in the accompanying discussion would be helpful.

3. Would the model be of particular use to beginning producers of instructional television?

JOHNSON-It is hard to say. The beginning producer may not have enough grasp on the challenge itself to be able to benefit from the suggested methods of the model. It is unclear "why" it is important to consider the approaches laid out. It would be helpful for the beginning producer to understand the instructional/motivational challenges of instruction that are trying to be met through this model. Again, more illustrative examples of technique are necessary to make this understandable to the beginning producer.

NEBRASKA EDUCATIONAL TELEVISION NETWORK-Yes as a tool to help organize material, to make people aware of what is possible through the use of television.

STASHEFF-Of particular value to beginning producers would be Segments one and two, if only as suggestions at the start of planning and checksheets for follow-up before going into rehearsal. The model would, however, need to be accompanied by the study of a book on production, as Mr. Morris suggests.

4. Please examine each stage of the model and comment on the strengths and weaknesses.

JOHNSON-The major weakness I see is that this appears



to be a model for producing a telecourse which appears to be most effective in translating lecture to screen which is, possibly, not the most pertinent use of video. The segments themselves seem to follow a lecture mode rather than taking advantage of video's ability to produce non-linear instructional patterns which may be more effective than other presentation modes. You have something important in mind, but it hasn't been actualized as effectively as it might be.

NEBRASKA EDUCATIONAL TELEVISION NETWORK-Again the reviewers felt the first section could be an organizer. One reviewer felt separating information from its usefulness was not a good idea. One reviewer again mentioned that the model is too vague to be useful for the type of work done at Nebraska ETV.

STASHEFF-Segment four would be of least value because, as described on pages 9 and 10, this evaluation was designed to assess the effectiveness of the model. In a practical, non-experimental situation, any evaluation would be concerned with the effectiveness of a program or series, not of the model.

In addition to these responses, the reviewers made some comments on the model. Johnson wondered if the third segment of the model, evaluation, was really a segment of the model or a post-production activity. Stasheff wondered if the connecting lines in the model were necessary. If so,

what are the purposes of the connections. Johnson thought that the prefixes Macro and Micro needed to be further explained. Johnson also felt the use of storyboard and electronic graphics, as called for in the model, were absolutely necessary. He indicated that even "greater sophistication of graphics are necessary for greatest effectiveness." Johnson was referring to the white characters on a blue background that were used in the treatment tape for this study. In the section of the model description that suggests that the illustrations of relevance be divided into "trend" for reviews of the past, and "projections" for analyses of the future, Johnson expressed reservations. He wondered if these approaches "don't limit the generic usefulness of the model." He wondered if all productions would benefit from these approaches. Finally, Johnson felt that video and theatrical processes as suggested by the PITV model--i.e., superimpositions, slow-motion, scenerios--are "great" but any one process should not be over used.

Although they expressed some support, overall the five evaluators seemed to express some strong reservations regarding the usefulness of the PITV model. All those who evaluated the model felt that it was more appropriate for beginning producers than for them. Indications by the evaluators that the use of visual and aural effects, varying camera angles, etc., were elementary, supports this

contention. Finally, the reviewers seemed to indicate that the model would be of greater use to them with more adequate descriptions in all three segments.

## CHAPTER 5 QUANTITATIVE AND QUALITATIVE FINDINGS

The results, reported in this chapter, have been organized into two categories, quantitative and qualitative. This is descriptive of their nature. Quantitative analysis, related to the two hypotheses, consisted of a comparison of achievement score differences between one control and two treatment groups. Qualitative data were derived from a focus group analysis of the 1981 control and treatment tapes.

One research question (number two) was formulated for a qualitative analysis of the videotapes from the 1981 experiment by Morris (1984) and the model. This was the focus group portion of the study and was used as a formative evaluation and led to the construction of the 1985 treatment tape two.

The qualitative results, which can be found in the first section of this chapter, were recorded and analyzed using the facilities of the College of Journalism and Communications at the University of Florida. The facilities included audio and video recording equipment and a conference room with a two-way mirror.

Two research hypotheses (1 and 2) dealt with achievement score differences on the posttest, between students who viewed the 1985 treatment and control

videotapes. This was the experimental portion of this study and has been used to investigate relationships.

The quantitative results, which can be found in the second section of this chapter, were analyzed using the computer system of the North East Regional Data Center at the University of Florida and incorporated procedures developed by the SAS Institute, Cary, North Carolina. All responses with incomplete identification numbers were eliminated.

## Results

### Focus Groups

The focus group evaluation was an outcome of research question number two. Does the information and feedback provided by a focus group suggest methods by which model-developed televised instruction might be revised and further improved?

Two focus groups were used to determine if students found differences between the treatment (model-developed) videotape and the control (nonmodel-developed) videotape used in the 1981 experiment by Morris (1984). One group consisted of five undergraduate students who had taken Economics 2013 (Principles), and the other group consisted of five students who had not taken Economics 2013. The two focus groups were asked to view the control (nonmodel-developed) and the treatment (model-developed)

videotapes from the 1981 experiment by Morris (1984) and to discuss them.

The focus groups were held from 7 to 9 p.m., January 23rd and 24th, 1985, in the research observation lab in the College of Journalism and Communications. The sessions were videotaped and audiotaped for thorough analysis and review. The tapes of these focus group sessions have been included as part of the material for this dissertation and have been made available, through the researcher, for future reviews of the evaluation process.

The responses of the students in the focus group evaluations have been summarized below beneath each interview question. Questions one through fifteen were asked as background questions. Questions 16 through 20 were asked after the participants viewed the control tape and again after they viewed the treatment tape. Two additional questions, 21 and 22, were asked after the participants viewed the treatment tape. In addition, questions 23 and 24 were asked after viewing three distinct segments of the treatment tape. The three segments consisted of (a) scenes with pop-in animation, (b) scenes with highlighting, and (c) scenes from the three-minute scenario.

Questions one through fifteen, background information.  
The students participating in both of the focus groups were between the ages of 18 and 22, with an average age of 20.

The group who had not taken Principles of Economics, hereafter referred to as the non-2013 group, consisted of three females and two males. Two of these students planned to take 2013, either because it was required, or because they thought it was an important course. Three of the students had no plans to take 2013. The group who had taken Principles of Economics, hereafter referred to as the 2013 group, consisted of two males and three females. All of these students took 2013 because it was required. The class rankings for both groups were heterogeneous, representing all four of the undergraduate levels. The grade point averages of the non-2013 group were evenly distributed between 2.1 and 2.7. The 2013 group averages were higher, ranging from 2.8 to 3.7.

The non-2013 group consisted of one sociology major, three advertising majors, and one undeclared. The 2013 group consisted of one advertising, one CIS business, one finance, and one broadcast management major. One person did not respond to this question. All of the student participants were full-time students carrying between 12 and 15 hours of student course work. All but one of the students had been exposed to some form of television in their classroom work. Most of the 2013 group had not been exposed to television viewing in the classroom. The 2013 group spent from 30 to 100 hours, with an average of 45

hours, watching television in college classrooms. All of the student participants thought a college education was important, with most believing it was very important or essential for obtaining skills to enter the job market. Descriptions of college teaching today ranged from routine to good. Other terms used were inconsistent, adequate, and insensitive. Three students felt that college teachers were generally helpful. Two students felt that many teachers lacked effective teaching methods. Most of the students were not in favor of using television to deliver the majority of their classroom instruction. They felt that television was impersonal, boring, and unmotivating. Students said they found it hard to pay attention to telecourses, and they felt as though they were not getting what they had paid for, namely an instructor. Two of the participants felt that some use of television was acceptable, and if well-produced, even desirable. One student thought that telecourses were a good idea because they offered flexibility in viewing times.

Finally, poor audio or video quality were cited by three of the students as problems that they encountered in taking telecourses. One student said that it was often difficult to see the chalkboard. Another student said that out-of-focus camera shots and shots of the teacher and audience made it difficult to follow the lecture.



Question Sixteen. What are your opinions about the videotape you have just seen? Both the 2013 group and the non-2013 group characterized the control tape as boring with poor video quality. Several also expressed difficulty in reading the chalkboard. Both groups found the treatment tape easier to see and follow. The 2013 group said they liked the treatment tape, thought they remembered more from it, and felt that the viewing time passed faster. The non-2013 group called the treatment tape a "vast improvement" and noted that it was easier to follow.

Participants in both groups thought the instructor was good but hard to follow in the control tape. The 2013 group felt that the treatment tape improved the instructor's effectiveness by directing the attention of the viewer.

Neither group found any problem with the audio quality in either tape. The non-2013 group found it difficult to hear questions from the students who attended the taping of the live lecture. Three of the 2013 group participants liked the music used in the "relevance illustrated" scenario contained in the treatment tape. One student said the music was good, but a little distracting. Only one person in the non-2013 group commented on the music. That individual said the music was good.

The 2013 group found that the methods of presentation used in the control tape were too abstract, contained too

much material, and jumped from concept to concept too quickly. By contrast, the same group found methods used in the treatment presentation to be interesting, more focused on the subject, less distracting, not as tiring, and easier to follow.

The non-2013 group found that the methods of presentation used in the control tape were adequate and thought that material presented was supported with examples. All of the participants of this group thought the methods used in the treatment tape made the lecture easier to follow. Three thought that the abstract examples were easier to follow and that the concrete examples used in conjunction with the abstract example in the "relevance illustrated" scenario helped in understanding the material.

Question Seventeen. What did you like about it? What did you not like about it? In the 2013 group one person felt that he had "learned something" from the control tape while another expressed dissatisfaction with the inability to ask questions. Two participants felt that the hypothetical questions asked by the instructor made them think. One participant in this group found that the treatment tape had clear graphics, and the others thought everything was good in this presentation. One participant felt that the flashing colored boxes placed around the important material were distracting. He suggested keeping

the boxes but eliminating the flashing. Moreover, one participant thought that the arrows were helpful for identifying specific items on the screen, particularly on graphs. He felt, however, that the arrows should be smaller.

The 2013 group appreciated television's potential for re-establishing charts when the numbers from those charts were used in graphs and formulas. In the control tape the charts were erased from the board, but in the treatment tape the charts were electronically generated and therefore could be recalled at any time. The 2013 group also felt that the scenario "helped to make sense" out of the facts presented in the treatment tape.

The non-2013 group felt that the control tape offered a greater opportunity to be distracted than a live presentation, and two participants expressed a tendency for falling asleep during this presentation. All participants of this group found the treatment tape to their liking, although one person felt that the scenario was distracting and unnecessary. The other participants disagreed, and one person said that this presentation "offered advantages that offset the disadvantages of not attending the live lecture."

Reviewing the videotape taken during the focus groups analyses, the researcher noticed that both groups of

participants appeared more exhausted and listless after the control tape than after the treatment tape. Although not giving the appearance of excitement, the students did seem more alert after viewing the treatment tape.

Question Eighteen. How does this presentation compare to other telecourses you have had? Only one person in the non-2013 group had taken a telecourse. That person thought that the instructor in the control tape made this telecourse better than most. That same person thought that the treatment tape was a vast improvement over all other telecourses encountered. The 2013 group said that some telecourses were better because they often included guest speakers. The group felt that many telecourses, however, were worse than this one because the writing on chalkboard was often more difficult to see. The 2013 group felt that the treatment tape was such an improvement over the control tape that they inquired if all telecourses could be quickly modified, after each lecture, to look like the treatment tape.

The 2013 group also reported that the camera, in other sections of this course, often failed to follow the subject being discussed. The camera often showed shots of the audience. These shots were called a distraction, not a break in the action. Two participants said that they had a problem in paying attention at all telecourse playbacks.

They indicated that disruptions at the playback sites made it difficult to watch the television.

Question Nineteen. How could this tape be improved?

The students in the non-2013 group gave the following suggestions for improving the control tape (a) use a different colored chalkboard, (b) use more color for clarity and, (c) correct irregularities in graphic reproductions. The group thought that the treatment tape was fine as it was. One person strongly objected to the entertainment aspects of the scenario in the treatment tape. The other members expressed support for the scenario, and then the objecting participant acquiesced, indicating that the scenario was acceptable. One person suggested that a minor improvement would be to have the instructor shape the lecture to the new graphics.

The 2013 group suggested that guest lecturers, similar to those used in other telecourses, might improve interest in the control tape. For the treatment tape, the 2013 group indicated that no improvements were needed. The only suggestion was to have the instructor speak to the visuals, rather than matching the visuals to the instructor's lecture.

Question twenty. What was the most important thing you learned from this class segment?

After viewing the treatment tape, two members of the non-2013 group said they learned about consumption, income, and savings. One person indicated that he did not learn much. Another said that boredom caused her to lose concentration. After viewing the treatment tape, one group member said he learned more about the relationship of the graphs to real-life situations. Another participant said she understood the relationship of consumption to income, and another said she understood those factors, other than income, that often affect consumption.

The 2013 group members indicated that they learned a little more about various economics consumption factors after viewing the control tape, but that this subject remained vague to them. One participant admitted to being confused, and another said that the central message could have been "clearer." After viewing the treatment tape, two participants expressed an understanding of "shifts in" versus "movement along" the consumption function. Two others discussed the effect of attitudes on consumption and said it had become much easier to understand. Two participants said that they understood how the MPC was calculated. One participant could recall the numbers that were selected from a table and used in a formula. A portion

of the table was superimposed over a formula.

Question twenty-one. What differences did you first notice between the presentations? When did you notice these differences? What were your thoughts at the time?

The non-2013 group noticed the different-looking title at the beginning of the treatment videotape, the new emphasis on graphics, and a more intricate production. They noticed the changes soon after the tape began. Two participants said that their thoughts at the time were that this would be a more interesting presentation.

The 2013 group first noticed the color (blue) on the tape instead of the chalkboard, "clearer" graphics, and the ability to recall charts for use in solving equations. The changes were noticed almost immediately. Three of the group members said they felt "relieved" when they first saw the changes. One participant recalled first noticing the improved graphics, and wondering at the time how the graphs would be developed. This participant was very pleased with the outcome.

Question twenty-two. What did you prefer about the videotape with the blue (model-developed) or black (nonmodel-developed) background?

None of the participants in either group commented on the control tape. In the non-2013 group, one student expressed an appreciation for the treatment tape but

indicated a preference for seeing more of the instructor. Other students disagreed and indicated that the improved graphics offset the lack of a visible instructor. One participant suggested that it might be interesting to find a method for combining the graphics and views of the instructor. Another student, however, said that the graphics were much more important. These improved graphics would make notetaking much easier.

The 2013 group unanimously thought that in effectiveness the treatment tape far exceeded the control tape primarily because of the graphics. One participant indicated a strong preference for white letters on blue background. This was supported by a comment that the writing on the chalkboard was unclear.

The treatment tape was divided into three segments, and students were asked two questions about each segment. Again the responses have been divided by the questions. The segments for discussion were as follows: (a) scenes with pop-in animation, (b) scenes with highlighting, and (c) scenes from the three-minute scenario.

Question twenty-three. What did you notice about this segment of the videotape? (a) About the segment with pop-in animation, the non-2013 group said the effect made the subject easier to follow. This process was considered preferable to writing on the board because this effect



permitted the entire word or subject to appear at once. The 2013 group said that the pop-in effect produced the visual as the instructor talked about it and therefore led the learner through the subject matter. Two participants thought the pop-in animation was preferable to writing on the board because the instructor or the instructor's hand often blocked the writing. One participant said that this was an essential part of the treatment tape.

(b) The non-2013 group said that the highlighting focused the interest of the viewer on the important section of the screen. The student who preferred the instructor over the graphics also preferred the instructor pointing over the highlighting. All of the 2013 group thought the highlighting was essential. One person suggested that the size of the highlighting be reduced. A participant recalled that in one case on the treatment tape the arrow blocked some of the numbers. It was suggested that the arrow be reduced in size. That participant also indicated that flashing the arrow was unnecessary because the arrow alone was effective.

(c) The person in the non-2013 group who had been critical of the entertainment aspect of this segment of the treatment tape did not comment but could be seen, in the videotape of the group session, shaking his head in disapproval. All others appeared to be watching intently,

and some were moving to the music. Three of the students expressed their approval of the scenario. The other participant expressed strong disapproval focusing on the scene at the checkout counter. An argument ensued, as the other participants attempted to explain the value of the music/drama in the scenario. One participant said that the music aided in recalling the concepts. Another discussed how the graphs (abstract examples) were related in the tape to real life (concrete examples). Another participant described how the scenario demonstrated relationships. The discussion finally ended because the participant who disliked the scenario decided to discontinue it. One participant added that the scenario added an advantage of providing for explanation not available in the control tape. The 2013 group thought that in an abstract format the moving graphs were very effective for demonstrating the relationship of changes in income to changes in consumption. They felt that the music assisted recall by relating the concepts to the examples. One participant added that the music helped hold the scenario together.

Question twenty-four. What improvements would you like to see in this segment of the tape? (a) The only improvement suggested by the non-2013 group in this segment was a more uniform letter y. In the 2013 group, one participant agreed that the characters could be improved.

One other participant, however, disagreed. Another participant suggested that a zero be placed in front of the decimal point to avoid confusion when reading from a distance.

(b) In the highlighting segment, one participant suggested removing the material not being highlighted to save the need for highlighting. Others, however, suggested no changes be made in the procedure. One participant in the 2013 group repeated an earlier suggestion of reducing the size of the highlighting box.

(c) The non-2013 group thought that the music in the scenario was very helpful and that it needed to be as dominant as the narrator. One participant thought that the transition between selected musical pieces could have been smoother. One participant suggested that the lady in the scene be cast so as not to appear so stupid. One person was not sure of the purpose of the comic element of the scenario but could recall everything in detail. The 2013 group thought that the music, the customers, and the moving graphics were all essential and effective. They did not suggest any changes. They did suggest that in other videotapes, skits could be used in place of music to add variety.

### Experimental

Two hypotheses were formulated for the experimental portion of this study. The first hypothesis involved a

comparison of student achievement scores between students who viewed treatment one and students who viewed the control tape.

Hypothesis 1. There will be no differences in student achievement between students who view model-developed televised instruction and students who view nonmodel-developed televised instruction.

The second hypothesis was developed from the data provided by the 1985 focus group analysis of the 1981 treatment tape. The strong criticism of the 1981 treatment tape came from a focus group participant who objected to the music/drama used in the scenario as an unnecessary distraction. After discussing this finding with Dr. David Denslow, the instructor in the course, who indicated that he had received similar complaints after the 1981 (Morris, 1984) experiment, the investigator decided to eliminate the production technique music/drama from treatment tape two and to measure the results of student achievement for treatment tape two against treatment tape one and the control tape.

Hypothesis 2. There will be no differences in student achievement between students who view model-developed televised instruction and students who view model-developed televised instruction with a selected production technique deleted.

Two measures of achievement, a pre- and posttest of student responses, were analyzed for significant differences. The results were organized into the following categories: (a) cumulative results on the overall posttest (Total); and (b) cumulative results over three questions on the posttest measuring understanding and application of the Consumption Function (Score). This second analysis involved test questions that covered the portion of both treatment tape one and treatment tape two that incorporated the highest production values and the portion where the music/drama occurred. This portion of both treatment tape one and treatment tape two was developed from the "Relevance Illustrated" segment of the PITY Model.

Table 5-1 reports the descriptive statistics--group sizes, overall means, and standard deviation--on the covariate (pretest) and dependent variable (posttest) for the three groups. The control group is group 1, experimental treatment group one (with music/drama) is group 2, and experimental treatment group two (without music/drama) is group 3.

TABLE 5-1

Descriptive Statistics for Pretest and Posttest Scores  
By Study Group

<u>Group</u>	<u>Covariate</u>			<u>Total</u>		<u>Score</u>	
	<u>n</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
1	57	18.4	4.11	6.14	2.37	1.30	0.96
2	31	18.5	3.70	7.58	2.74	1.81	0.79
3	25	18.6	4.63	7.84	2.36	1.76	0.88

Visual inspection of Table 5-1 resulted in the conclusion that the means for all three student groups were not substantially different on the covariate, indicating that any between group differences on the posttest could not be attributed to between group differences on the pretest. With respect to the groups' Total test scores, control group 1 had a lower mean score (6.14) than the experimental groups 2 (7.58) and 3 (7.84), which had approximately equal means scores. With respect to the groups' Score, control group 1 had a lower mean score (1.30) than the experimental groups 2 (1.81) and 3 (1.76) which had approximately equal means scores. The analysis of covariance (ANCOVA) was analyzed to determine the significance of these mean differences and the results were reported in Tables 5-2 and 5-3.

The data were analyzed using ANCOVA, with a pretest as a covariate. As a preliminary step, the homogeneity of slope assumption was tested. The test was not significant for Total,  $F(2,107)=.91$ ,  $P > .40$ , or for Score,  $F(2,107)=1.17$ ,  $p > .45$ .

Table 5-2 presents a summary of the ANCOVA for Total test scores. This analysis was conducted as a test of Hypothesis 1. There will be no differences in student achievement between students who view model-developed televised instruction and students who view nonmodel-developed televised instruction.

TABLE 5-2

ANCOVA for Total

<u>Source of variance</u>	<u>DF</u>	<u>S.S.</u>	<u>M.S.</u>	<u>F</u>	<u>p</u>
Treatments	2	86.62	33.39	6.29	0.0026
Error	109	577.20	5.30		

The reported results indicate in Table 5-2 that there was a significant difference among the three groups on the overall posttest (Total),  $p=0.0026$ . With a confidence level of .05, hypothesis 1 was not accepted. Therefore, one or more of the groups had test scores that were significantly different from another or others. To determine where the significant differences existed, pairwise comparisons were

made. The results of these pairwise comparisons are reported in Table 5-4.

Table 5-3 presents a summary of the ANCOVA for Score. This analysis was conducted as a test of Hypothesis 2. There will be no differences in student achievement between students who view model-developed televised instruction and students who view model-developed televised instruction with a selected production technique deleted.

TABLE 5-3

ANCOVA for Score

<u>Source of variance</u>	<u>DF</u>	<u>S.S.</u>	<u>M.S.</u>	<u>F</u>	<u>p</u>
Treatments	2	6.47	3.23	4.47	0.0137
Error	109	79.04	0.73		

The results reported Table 5-3 indicate that there was a significant difference among the three groups on the three items in Score,  $p=0.0137$ . With a confidence level of .05, hypothesis 2 was not accepted. Therefore, one or more of the groups had test scores that were significantly different from another or others. To determine where the significant differences existed, pairwise comparisons were made and reported in Table 5-5.

Table 5-4 reports the results of the pairwise comparison for the students' Total scores and is related to



Hypothesis 1. This comparison was made to determine which tape, treatment tape one, treatment tape two, or the control tape, produced higher student achievement on the overall posttest.

TABLE 5-4

Pairwise comparisons for Total

---

<u>Group</u>	<u>Mean Difference</u>	<u>p</u>
2 vs. 1	1.44	.0069
3 vs. 1	1.70	.0032
3 vs. 2	0.26	.6876

---

The pairwise comparisons indicated that experimental group 2, which viewed treatment one (with music/drama), and experimental group 3, which viewed treatment tape two (without music/drama), have significantly different results on the overall posttest (Total) from control group 1, ( $p=.0069$  and  $p=.0032$ ) but not from each other. Overall, both treatments appear to have been equally effective and both appear to have been more effective in producing student achievement than the control tape.

Table 5-5 reports the results of the pairwise comparison for Score and is related to Hypothesis 2. This comparison was made to determine which videotape produced higher student achievement.

TABLE 5-5

Pairwise comparisons for Score

---

<u>Group</u>	<u>Mean Difference</u>	<u>p</u>
2 vs. 1	0.51	.0098
3 vs. 1	0.46	.0297
3 vs. 2	0.05	.8285

---

For the three questions on the posttest measuring understanding and application of the Consumption Function (Score), and related to Hypothesis 1, only experimental group 2, which viewed treatment tape one (with music/drama), was significantly different from the control group 1 ( $p=.0098$ ). Experimental group 3, which viewed treatment tape two (without music/drama), was not significantly different, at the .05 level, from the control group 1. The experimental groups were not significantly different from each other. The difference between the means for experimental 2 (treatment tape one) and the control group was only .15 points (8%) greater than the difference between the means for experimental 3 (treatment tape two) and the control group.

Summary

Two groups of students between the ages of 18 and 22, were used to analyze the treatment (model-developed)

videotape and the control (nonmodel-developed) videotape from the 1981 experiment by Morris (1984) to find perceived differences. The focus group evaluation was an outcome of research question number two. Does the information and feedback provided by a focus group suggest methods by which model-developed televised instruction might be revised and further improved?

All but one of the students had been exposed to a great deal of television in the college classroom, watching an average of 45 hours. Most of the students were not in favor of using television to deliver the majority of their classroom instruction proclaiming it impersonal, boring, and unmotivating.

Moreover, both groups characterized the control tape as boring with poor video quality but found the treatment tape easier to see and follow. The treatment tape was said to have clear graphics, although the flashing of the colored boxes were found to be somewhat distracting. The most distracting aspect of the treatment tape, as seen by one student in particular, was the entertainment aspect or the music/drama in the scenario. Others felt that the drama and accompanying music were a little silly but helpful in understanding the subject matter. The strongest disagreement, in the focus group analysis, occurred over the use of the music/drama production technique, therefore, this

production technique seemed worth testing. The test was conducted to determine if the treatment tape used in the 1981 experiment by Morris (1984) could be further improved. Furthermore, the answer to research question two was, "yes" student students were able to identify television production techniques that they felt were helpful or that they felt were distracting.

Testing of the focus group finding was conducted using the analysis of variance (ANCOVA), two treatment tapes, two experimental groups, and one control group. The ANCOVA was used to test the hypotheses (a) There will be no differences in student achievement between students who view model-developed televised instruction and students who view nonmodel-developed televised instruction; and (b) there will be no differences in student achievement between students who view model-developed televised instruction and students who view model-developed televised instruction with a selected production technique deleted? The selected production technique was music/ drama. Neither hypothesis was accepted, with a p statistic of 0.0026 and 0.0137 respectively. As in the 1981 experiment the 1985 treatment (model developed) tapes showed improved student achievement over the control (nonmodel-developed) tape.

Since treatment tape one showed improved achievement over the control tape on the overall posttest, as well as on

the three questions on the posttest measuring understanding and application of the Consumption Function, the results of this experiment were better than those in the 1981 experiment by Morris (1984). The production technique selected by the focus group analysis and eliminated from treatment group two did not prove to be distracting; on the contrary, it proved to be a small but essential variable when combined with other variables or television production techniques.

## CHAPTER 6 CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

### Introduction

The purpose of this study was to analyze and compare the effects of a segment of televised instruction which adhere to elements of a producer's model, the PITV Model, with a camera of record (nonmodel-developed) segment of televised instruction in a college course. Both quantitative and qualitative methods of evaluation were used to conduct the analyses and to make the comparisons. The methods of evaluation were (a) an expert analysis of the PITV Model, (b) a focus group analysis of the treatment and control tapes from the 1981 experiment by Morris (1984), and (c) an experimental comparison of two treatment tapes, developed from the focus group analysis of the 1981 treatment tape. The conclusions, a discussion of the implications, and the recommendations that follow are an outgrowth of these analyses and comparisons.

### Conclusions

Model evaluation. Did experts, who were asked to evaluate a producer's model, find it useful for producing televised instruction? A qualitative analysis of the Producers' Instructional Television (PITV) Model was conducted using a survey questionnaire. A description of the Model together with a questionnaire was sent to a select

group of five telecourse producers. These producers were asked to analyze the model by addressing its perceived usefulness. The experts did not find the model particularly helpful but some thought that the model could be used with beginning producers of instructional television programs. Most of those evaluating the model felt that they understood how to develop instructional television and did not need the model. There was some indication that the model appeared to be too simplistic and included inadequately defined concepts. Future development of the model should lead to a change in these impressions.

There was some indication that the model was too sequential in nature for a television presentation. This sequentiality is more of a visual characteristic of model diagrams and is not a major aspect of the PITV model. As currently stated in the model explanation, this apparent sequentiality is not related to the application of the PITV Model and may be disregarded. It should be noted that in the application of the model for the development of the treatment tapes for this study, the illustration of relevance (as per segment two of the PITV Model) of the consumption function was placed in the middle of the lecture, before some of the facts about the process of the consumption function had been presented. As in many classroom presentations, this placement was derived by what

appeared to be logical sequencing. Although a difficult task, the process of sequencing the model segments for a telecourse may offer a problem worth further study.

Focus groups. Does information and feedback provided by a focus group suggest methods by which model-developed televised instruction might be revised and further improved?

A qualitative focus group evaluation was used to compare and analyze televised instruction that adhered to elements of a producer's model with a camera of record (nonmodel-developed) presentation. Two groups of five students were asked to view a treatment (model-developed) videotape and control (nonmodel-developed) videotape from the 1981 experiment by Morris (1984). They were asked to note specific instructional techniques that they perceived to be effective or ineffective. No distinctions were found between groups regarding age, sex, or course load. The group who had already taken Principles of Economics 2013 had considerably more experience with television in the classroom than the non-2013 group. Those with more classroom television experience held telecourses in low esteem, finding it impersonal, boring, and lacking in stimuli for motivation. These students also indicated a dissatisfaction with the quality of the video in most telecourses. This factor may have contributed to the low



opinion, in general, of the use of television in the classroom.

Several students found minor elements in the treatment approach that they wanted to see changed. All of the students found the treatment videotape preferable to the control videotape. And although most of them indicated that the treatment tape was more interesting--"more focused, less distracting, not as tiring, and easier to follow"--one student in the non-2013 group had serious reservations about the scenario. These reservations focused around the entertainment aspects of the scenario in the "relevance illustrated" portion of the treatment presentation. The other recommendations, such as reduce the size of the arrow used in highlighting, or eliminate the flashing of the box also used for highlighting, were considered helpful but minor. One suggestion that was considered more suitable for modification and then testing was to match the audio to the video instead of the current method of matching the video to the audio. Since the telecourse's content or the approach to the content would not be changed, this recommendation was considered an appropriate method for application when producing an entire telecourse and not one segment. Other suggestions that appeared appropriate for consideration when developing the complete telecourse were (a) make the instructor more visible, (b) initiate better casting for

parts in scenarios, and (c) attempt better coordination of music with the pictures.

For the most part, the single most controversial issue was the music/drama portion of the scenario in the treatment tape. The student who disliked this aspect provided oral as well as visual disapproval of it. Since the removal of the entertainment aspect of the scenario would affect the approach to the content, this was seen as a significant change, and worthy of further testing. The instructor in the course, Dr. David Denslow, concurred since he had received similar comments after the 1981 experiment. It was decided, therefore, based on the strength of the issue, to drop the entertainment, music/drama, aspect from one treatment tape and then test two treatment tapes, one with music/drama and one without music/drama, for differences in student achievement. The success of this recommended change will be discussed in the next (experimental comparisons) section.

Experimental comparisons. Hypothesis 1. There will be no differences in student achievement between students who view model-developed televised instruction and students who view nonmodel-developed televised instruction.

Hypothesis 2. There will be no differences in student achievement between students who view model-developed televised instruction and students who view model-developed

televised instruction with a selected variable deleted. An experimental design (ANCOVA) was used to analyze and compare test scores of students who viewed three different versions of the televised instruction. One class section was shown the camera of record (nonmodel-developed) presentation and served as the control group. Another section was shown televised instruction, treatment tape one, that adhered to elements of the (PITV) Model and included music/drama. A third section was shown televised instruction, treatment tape two, which adhered to elements of the PITV Model but excluded a production technique, music/drama, that the focus groups found to be an unnecessary distraction.

The experimental evaluation showed the model to be an effective method of improving telecourse videotapes, therefore, hypothesis one was not accepted ( $p=0.0026$ ). Student test scores improved, up to 14% (mean difference=1.70), over a camera of record presentation when the videotape was developed using the PITV Model.

The experiment also showed that when music/drama was eliminated from the treatment tape (treatment tape two), mean scores diminished. Therefore hypothesis two was not accepted ( $p=0.0137$ ). The focus group indicated that the music/drama that had been included in 1981 treatment tape might have been unnecessary and distracting. At the .05 level, treatment tape one (with music/drama) had

significantly better mean scores, up to 17% (mean difference=0.51), than the control tape, on three questions on the posttest measuring understanding and application of the Consumption Function. On the same questions, treatment tape two (without music/drama) was not significantly different from the control tape. The small difference in mean scores, two per cent (mean difference .05), between the two treatments indicates that the music was an important variable but singly the effectiveness was minor.

Therefore, this study showed that in the telecourse Principles of Economics 2013, at the University of Florida, in the Spring Semester of 1985, student achievement scores were improved, over the camera of record videotape, when a treatment tape was designed with a producer's (PITV) model for televised instruction. However, video techniques alone were not sufficient enough to improve learning when the attempt was to teach the relevance of the principles of the consumption function, the subject of the tape, to consumer behavior. In this "relevance illustrated" portion of the videotape, music/drama appeared to be important to improved student achievement in the PITV Model developed videotape when compared to the camera of record presentation.

#### Implications

An analysis of the expert evaluations of the PITV Model indicates the model needs more work in order to be

useful to producers of instructional television, particularly advanced producers. The model may be more useful to beginning producers and producers whose experience has been limited to camera of record presentations. The importance of an expanded PITV Model, which includes more detailed examples, cannot be overstated. Also of importance is the clarification of the visual inaccuracy of the model format. Visually, the model depiction implies a sequencing. In reality, the model does not suggest a sequencing pattern. This problem is inherent in the attempt to visualize the model. Whether the model is drawn in a circular format or a vertical format, the illustration implies a sequencing. In reality, the user of the PITV Model may choose the sequencing of the lesson regardless of the model, based on the content of the lesson and the needs of the audience. The purpose of the PITV Model is to suggest the type of production technique that will best relate the subject matter to the audience. A clear understanding of the purpose of each segment of the PITV Model is essential to successful implementation. Users of the PITV Model should be trained in the application of the model. This may take the form of an inservice training program, or specialized courses in instructional media that incorporate procedures for the application of the PITV Model.

Focus groups may prove to be useful for identifying those techniques in a telecourse that do not contribute to its effectiveness, or for suggesting other techniques which might contribute to the effectiveness. As indicated by the results of the experiment in this study, however, the treatment tape that has been revised according to the recommendations of focus groups, must be experimentally tested to measure the effect of an addition or deletion. As implied by the results of this study, testing, re-evaluating, and retesting are important to the development of a refined instructional television production. Careful application of the PITV Model should produce a telecourse with improved achievement over a camera of record presentation.

The results of the experimental comparisons of the camera of record presentation with the PITV Model-developed presentation indicate that modifying the standard "talking head" lecture/chalkboard videotape--with preproduced graphics, "pop-in" and moving animation, on-location vignettes, freeze frames, animated moving graphs, and music--can improve achievement. In addition, replacing the lecture as the medium for delivering the conceptual relevance of a topic with telecourse segments which incorporate high television production values, including music/drama, also can improve achievement. Improved

achievement was not maintained in the experiment when the music/drama was eliminated from the treatment presentation as suggested by a focus group member. This result supports the theory that the combined effect of several television production variables, or television production techniques, may be greater than the effect of the sum of individual variables or techniques. In this study, for example, the music/drama variable had a significant but minor role in improving achievement.

These results show that television production techniques can have an effect of improving student achievement in a college classroom, however, these results do not preclude the value of following a television presentation with a live classroom discussion. For that matter, the PITV Model approach may help to ensure retention and better prepare the student for such a discussion.

#### Recommendations for further study

The results obtained from the focus groups and from the experiment must be evaluated within the limitations of a single execution. Therefore, several recommendations for further study can be made.

1. Determine if the favorable results obtained in one lesson in Principles of Economics can be expanded to other lessons and to other courses.
2. Determine if variables or television production

techniques other than music/drama have the same effect on student achievement.

3. Determine if students of telecourses have become preconditioned by the usual camera of record style of television production to have negative attitudes about telecourses. Can these attitudes be changed by successive improvements in television production techniques in a telecourse, and thereby, lead to further improvements in achievements?
4. Determine if the attitude of those students who do not like certain television production techniques, can have an effect on student achievement.
5. Determine if the inability of the focus group to identify production techniques which are ineffective or distracting is typical, thereby, eliminating the effectiveness of the focus group.

In summary, the favorable reactions to the treatment tape in the focus groups are, perhaps, sufficient justification for improving the methods used for visual indications in a camera of record presentation when the sole method of illustration is the chalkboard. In addition, complex material that requires an illustration of relevance, may be too important in many subject areas to be entrusted solely to the lecture method. Educators should re-evaluate



the qualities and abilities that are characteristic of the high production values and techniques in television.

Hopefully, this study, using the PITV Model, has helped to strengthen the need for innovation in educational media development. The PITV Model suggests methods for innovative or creative approaches to telecourse development, but does not suggest that simply increasing production values will increase achievement. It is important to merge scientific and artistic approaches, as suggested by the model, into instructional television development, in order to obtain a product that is academically significant. This process is similar to that used in many advertising campaigns. By using qualitative and quantitative evaluation, the PITV Model approach attempts to merge the interests and vulnerabilities of the audience into the instructional product by matching these characteristics with the methods for presenting the content material. Paramount then to the successful application of the PITV Model is the incorporation of facts with emotion. This incorporation can be effectively accomplished by maintaining optimum visual and aural stimuli and can be accomplished only if producers are effectively trained in such techniques.

APPENDIX A

COVER LETTER AND  
QUESTIONNAIRE FOR TELECOURSE EXPERTS

January 10, 1985

Mr. Don Johnson  
WNET  
356 W. 58th St.  
New York, New York 10019

Dear Mr. Johnson:

Thank you for agreeing to assist in the evaluation of the "Producers ITV Model". As we discussed, your experience in instructional television will be invaluable in determining the usefulness and applicability of the model.

The "Producers ITV Model", was developed and used in an experiment at the University of Florida. One fifty minute class in the Principles of Economics course was isolated and reproduced using the guidance of the model (reported in the Journal of Educational Technology Systems, Spring, 1984, or in the October, 1984, T.H.E. Journal).

Examples of the implementation of the model in the Economics Class experiment have been cited in the attached description to provide clarification. Please look over the model and the instructions for implementation. Your response/reaction is to be recorded on the accompanying "Producers ITV Model" evaluation form. If the evaluation form does not provide enough space please attach a separate page. You may also mark directly on the model or instruction pages.

Thank you for participating in the analysis of the "Producers ITV Model".

Sincerely,

Jon D. Morris

PS. Please respond by January 31 if possible.

Producers ITV Model  
Evaluation

1. Would the model be of assistance to you in a telecourse or an instructional television production? If so, why? If not, why not?
2. Are there any parts of the model you find more useful than others? Please explain.
3. Would the model be of particular use to beginning producers of instructional television?
4. Please examine each stage of the model and comment on the strengths and weaknesses.
5. Please provide brief background information about your experiences in instructional television.

APPENDIX B

LIST OF EXPERTS  
AND THEIR ADDRESSES

Edward Stasheff  
307 Westwood St  
Ann Arbor, Michigan 48103

Don Johnson  
WNET  
356 W. 58th St.  
New York, New York 10019

Lee Rockwell  
Nebraska ETV  
PO Box 83111  
Lincoln, Nebraska 68501  
(Note: Mr Rockwell was the representative for three  
anonymous telecourse producers.)

## APPENDIX C

### FOCUS GROUP INTERVIEW SCHEDULE

## Focus Interview Schedule

### (I) Introduction 5 min.

Welcome to the telecourse evaluation focus group. Thank you for agreeing to assist in this process. The purpose of this evaluation is to provide telecourse producers with feedback from those who must learn from their product. I want to hear your candid opinions about the teaching methods and the learning environment. Your views will be cited anonymously. This is not a test, so there are no correct responses. If you disagree with the opinions being expressed at any time, please do not hesitate to say so, even if you are in the minority.

### (II) Background questions 10 min.

This first set of questions has been designed to provide us with some background information. This is a questionnaire and is the only written portion of the evaluation. Again, please feel free to express your opinion at any point.

#### BACKGROUND INFORMATION

Directions: Please provide a short response to each question. If you need to qualify or otherwise modify your response, please feel free to do so.

1. Age\_\_yrs.
2. Sex\_\_
3. Class rank\_\_\_\_(Fr=Freshman, So=Sophomore, Etc)
4. GPA\_\_ Cumulative Undergraduate
5. Major/Department\_\_\_\_\_
6. Your average course load per term\_\_\_\_\_
7. Hours per week you spend watching television outside of class\_\_\_\_\_
8. Hours you have spent watching television in your college courses/class (estimate)\_\_\_\_\_
9. How valuable is a college education today (in one word)?  
\_\_\_\_\_

Why? (in a sentence)



10. How would you describe the quality of college teaching today (in one word)?\_\_\_\_\_

Why?

11. Have you taken a principles of economics course either Economics 2013 or another? YES\_\_\_\_ NO\_\_\_\_

If yes then please indicate which and why you took it(them)?

Course title\_\_\_\_\_

Why\_\_\_\_\_

Course title\_\_\_\_\_

Why\_\_\_\_\_

12. If the answer to the above question is "No" will you be taking a principles of economics course in the future.  
Yes\_\_\_\_ No\_\_\_\_ Don't know\_\_\_\_\_

Why?

13. What is your major opinion about the use of television in college classes today(in a sentence or two)?

14. What are your opinions about telecourses, courses taught entirely by television, in general?

15. What problems have you encountered, if any, in taking telecourses?

(III) View Control Tape (Camera of record) 50 mins.

Now I am going to ask you to watch one videotaped session of the telecourse Economics 2013 as it is currently being produced in the College of Business. Afterwards I am going to ask you a few questions about the presentation. This tape will be referred to as the tape with the black background.

ROLL TAPE

(IV) Interview discussion of Control Tape 15 min.

Now I am going to ask you a few questions about the tape (the black background) you have just seen. Please feel free to express your opinions even if they conflict with someone else's opinion. If someone else's response brings to mind an idea or an opinion, express it.

16. What are your opinions about the videotape you have just seen?

Probe

Visual

Presenter

Audio

Method of presentation (including presentation of concrete and abstract examples, and relevance of the subject matter explained)

Other

17. What did you like about it? What did you not like about it?
18. How does this presentation compare to other telecourses you have had?
19. How could this tape be improved?
20. What was the most important thing you learned from this class segment?

(V) View Treatment Tape (Model developed) 50 min.

Now I am going to ask you to watch another videotape version of the same session of the telecourse Economics 2013. Afterwards I am going to ask you a few questions about this presentation.

ROLL TAPE

(VI) Interview discussion of Treatment Tape 15 min.

Now I am going to ask you a few questions about the tape (blue background) you have just seen. Again, please feel free to express your opinions even if they conflict with someone else's opinion. If someone else's response brings to mind an idea or opinion, express it.

16. What are your opinions about the videotape you have just seen?

Probe

Visual

Presenter

Audio

Method of presentation (including presentation of concrete and abstract examples, and relevance of the subject matter explained)

Other

17. What did you like about it? What did you not like about it?
18. How does this presentation compare to other telecourses you have had?
19. How could this tape be improved?

20. What was the most important thing you learned from the tape with the blue background?
21. What differences did you first notice between the presentations? When did you notice these differences? What were your thoughts at the time?
22. What did you prefer about the videotape with the blue or black background? (Please identify the tape you are talking about.)

(VII) Selected viewing of segments of Treatment Tape with discussion of each segment 15 min.

(Note: The treatment tape will be divided into the following segments for discussion: (1) scenes with pop-in animation, (2) scenes with highlighting, and (3) scenes from the three minute scenario. The questions should be repeated with each segment to provide consistency.)

Now I am going to show you a few chosen segments from the video tape with the blue background. I will stop the videotape after each segment to ask you about that segment. In this session, please try to be as specific as you can about what you like or dislike about that segment. Feel free to offer any suggestion for improving that segment.

ROLL TAPE-PAUSING AFTER EACH SEGMENT TO ASK THE QUESTIONS THAT FOLLOW

23. What did you notice about this segment of the videotape? (Label: segment 1, 2, or 3)

Probe

Visual

Presenter

Audio

Method of presentation (including presentation of

concrete and abstract examples, and relevance of the subject matter explained)

24. What improvements would you like to see in this segment of the tape? (Label: segment 1, 2, or 3)

Probe

Graphics

Scenarios

Sound effects

Music

Highlighting

Structure

Method of presentation (including presentation of concrete and abstract examples, and relevance of the subject matter explained)

Emphasis

(VII) Conclusion and presentation of gifts 15 min.

That concludes the focus group interviews. Thank you for agreeing to participate. I have a small token of my appreciation for you.

HAND OUT GIFTS AND THANK EACH PARTICIPANT PERSONALLY.

## APPENDIX D

### POSTTEST OF THE CONSUMPTION FUNCTION

Please put your name and social security number on the answer sheet. You do not need to indicate your section number. However, please enter special code 1-1, and mark this as test form B.

1. If the MPC is a constant 0.9, then we know that
  1. the consumption function is a straight line.
  2. the consumption function is a straight line going through the origin.
  3. the consumption function is a straight line going through the origin, and having a slope of more than 1.
  4. all of the above.
2. If consumption is 80 when income is 100, and consumption is 150 when income is 200, then
  1. the MPC = 4
  2. the MPC = .4
  3. the MPC = 1.4
  4. the MPC = .7
3. According to the definitions given in lecture
  1. the slope of the consumption line is the APC.
  2. the slope of the savings line is the APC.
  3. the slope of the consumption line and the slope of the savings line sum to one.
  4. the slope of the consumption line and the slope of the savings line sum to zero.
4. An MPC of less than 1 means that an increase in household income would cause consumption expenditures to
  1. rise by less than the full increase in income.
  2. fall slightly, since the increase in income will increase savings.
  3. rise by the full increase in income.
  4. stay the same, since the MPC is also less than 1.
5. Changes in consumption can occur
  1. with changes in income only.
  2. without changes in income due to shifts in attitude, wealth, inflation and interest rates.
  3. with changes in taxes only.
  4. none of the above.
6. The marginal propensity to consume is
  1. the level of consumption divided by the level of income.
  2. the change in consumption per unit change in income.
  3. the level of consumption deflated by the price level.
  4. the change in consumption per unit change in the price level.

7. A consumption - income pair illustrating autonomous consumption is
  1.  $C=100, Y=500$
  2.  $C=500, Y=500$
  3.  $C=500, Y=0$
  4.  $C=350, Y=500$
  5.  $C=0, Y=100$
8. Movement along the consumption function would be caused by a change in
  1. the price level.
  2. interest rates.
  3. income.
  4. stock market.
  5. all of the above.
9. At the break-even point on the consumption function, households
  1. are broke.
  2. consume an amount equal to their disposable incomes.
  3. save an amount equal to their disposable incomes.
  4. consume half their disposable incomes, and save half.
10. As disposable income goes up
  1. the volume of saving declines absolutely.
  2. the volume of investment can be expected to diminish.
  3. the volume of consumption declines absolutely.
  4. the ratio of savings to income falls.
  5. the ratio of consumption to income falls.
11. If Smith's disposable income increases from \$1,200 to \$1,700 and his level of savings increases from minus \$100 to a plus \$100, it may be concluded that his marginal propensity to
  1. consume is one-sixth.
  2. consume is three-fifths.
  3. consume is one-half.
  4. save is three-fifths.
12. Shifts in the consumption function will occur with changes in
  1. consumption and income.
  2. interest rates.
  3. income.
  4. disposable income.
  5. all of the above.



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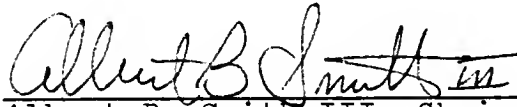
## BIOGRAPHICAL SKETCH

Jon D. Morris was born in Wabash, Indiana, on July 14, 1944. He attended public school, and at Wabash High School he received his first contact with telecommunications as a broadcaster on the high school FM radio station, WSKS. In 1967, he graduated from Transylvania University with a Bachelor of Arts degree. From 1968 through 1972, he worked in New York City at two advertising agencies, Dancer Fitzgerald Sample and Doyle Dane Bernbach. It was at the latter agency where he received his greatest inspirations in the effective use of media. In 1974 he was a Partner and Creative Director of Nicholson-Morris, Louisville, Kentucky.

In 1977, he returned to higher education to pursue a Master of Science in Mass Communications, graduating from Murray State University in 1978. In 1979, he entered the University of Florida to combine the skills of communications with education by seeking a Ph.D. in education with an emphasis in communications. In 1983 he entered the postsecondary education program area in the Department of Instructional Leadership and Support and was admitted to doctoral candidacy in May of 1984.

Currently, he is a faculty member in the College of Journalism and Communications at the University of Florida. He also conducts focus group research of telecourses for Research Communications of Boston.

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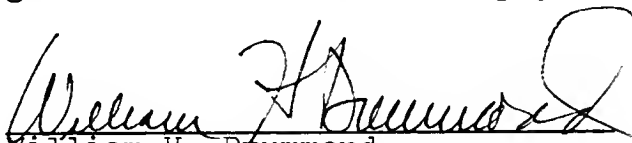
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